Draft EIS
UPPER DELAWARE
SCENIC AND RECREATIONAL RIVER

January 31, 1986

Prepared by National Park Service, Mid-Atlantic Regional Office, Division of Park and Resource Planning; in consultation with the State of New York, Commonwealth of Pennsylvania, Conference of Upper Delaware Townships, Delaware River Basin Commission, Citizens Advisory Council, and other public and private interests.

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SUMMARY

Draft Environmental Impact Statement for the Proposed River Management Plan - Upper Delaware Scenic and Recreational River, New York/Pennsylvania.

Responsible Agency - U.S. Department of the Interior, National Park Service, Mid-Atlantic Regional Office.

Abstract - The Conference of Upper Delaware Townships, in cooperation with the Commonwealth of Pennsylvania, the State of New York, the Delaware River Basin Commission and the National Park Service, has developed a proposed river management plan for the Upper Delaware Scenic and Recreational River. The proposed plan recommends a revised river corridor boundary, land and water use guidelines, the formation of a Management Council to implement the plan, and procedures for river management, describes how the enabling legislation will be carried out, and identifies the roles of the cooperating agencies during the next twenty years or longer. The plan requires the approval of the Secretary of the Interior.

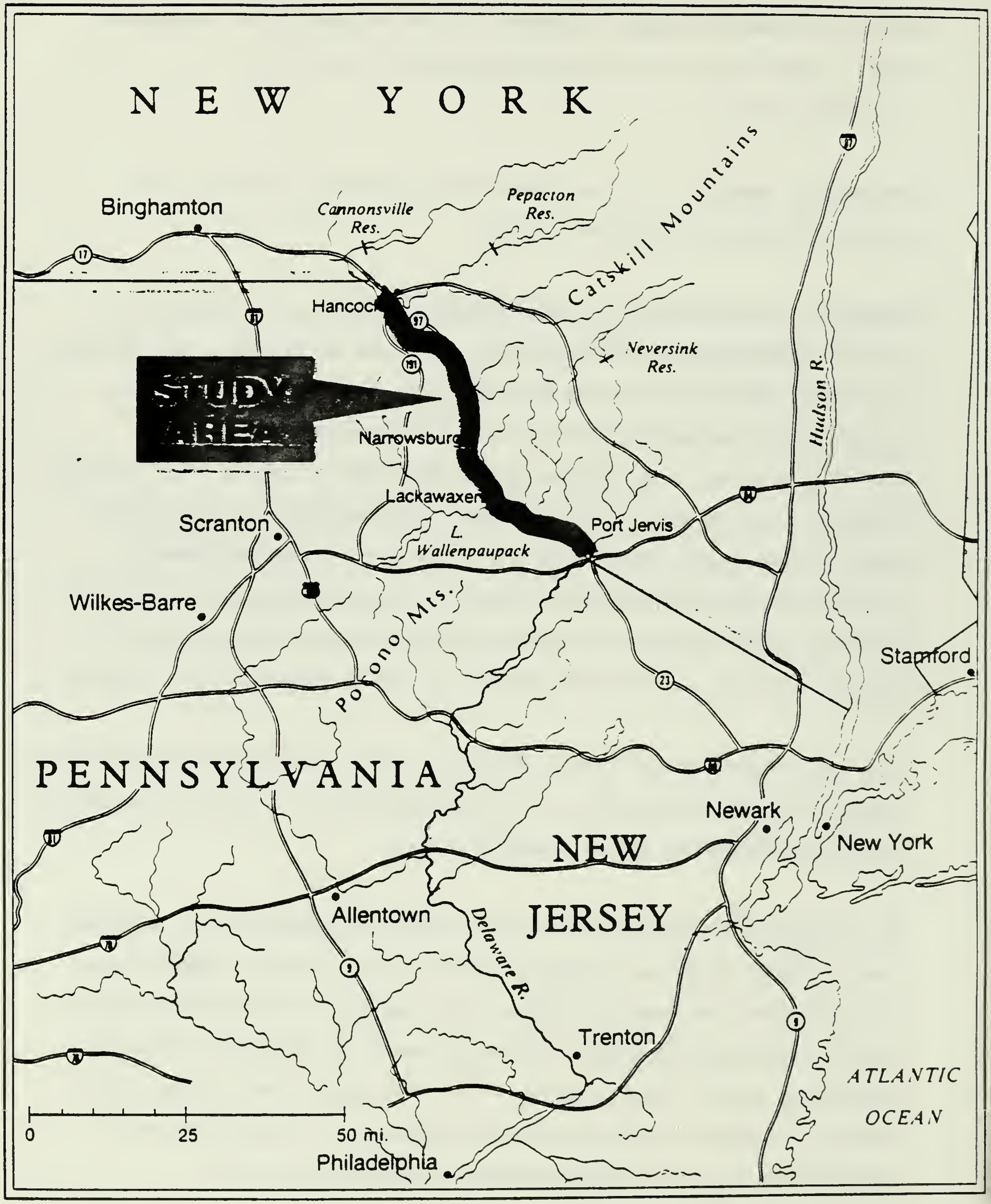
This Draft Environmental Impact Statement (DEIS) assesses the environmental impacts of three alternatives: the proposed plan, a no action alternative, and implementation by NPS of a modified plan.

The proposed plan would provide a high degree of protection to important river related resources through the use of local land use controls and existing state and federal statutes. The quality of fisheries and water quality would be maintained. Recreation would be enhanced through the addition of public fishing access, river rest stops, and visitor center. Impacts to cultural resources would be minimized. Land values would increase and costs to local governments would be negligible.

UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

The Delaware River Region

Prepared by National Park Service, Mid-Atlantic Region



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CHAPTER I - PURPOSE AND NEED

A. Purpose

The Upper Delaware legislation (P.L. 95-625) requires that the Secretary of the Interior in cooperation with the Delaware River Basin Commission, the Citizen's Advisory Council, the Commonwealth of Pennsylvania, the State of New York and their concerned political subdivisions develop and approve a river management plan. The purpose of the proposed Upper Delaware River Management Plan is to set forth how the resources of the Upper Delaware River corridor will be conserved and how visitor use will be managed through cooperative federal, state, local and private efforts. If approved, this plan will guide the future actions of the National Park Service (NPS) and other agencies and units of government in the management of the river and adjacent land resources for the next 20 years.

B. Need

The Upper Delaware River is one of only four river segments in the Northeastern U.S. to have been designated as a component of the National Wild and Scenic Rivers System. To receive such recognition, a river and its surrounding environment must be free-flowing and relatively undeveloped, and must possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic and cultural resources, or other similar values. Designated rivers, by law, are to be preserved in free-flowing condition and protected for the benefit and enjoyment of present and future generations. The Delaware River is the only major river in the Northeastern United States that remains undammed along its main stem, although its flow is controlled by several tributary dams.

The high water quality of the Upper Delaware, in part attributable to the rural, sparsely settled nature of the region, is also an important resource, which has prompted the Pennsylvania Department of Environmental Resources to designate the watershed as a special protection area.

The landscape of the Upper Delaware area is a visually diverse one, characterized by the contrast of farmland and villages on the valley floors with the forested hills that surround the valley. The Delaware River Gorge, which extends north from Matamoras, Pennsylvania, for much of the corridor's length, has been identified by the Pennsylvania Geological Survey as an outstanding scenic geologic feature.

The Upper Delaware provides some of the most important fish habitat in the Northeast, because of its free-flowing nature, high water quality, and cold water releases (from reservoirs on tributaries). The northern segment of the river, between Hancock and Callicoon, is unique due to its cold water temperatures, and offers some of the finest trout fishing in the Northeast. The Upper Delaware is currently the only natural shad river from Maine to West Virginia that is sufficiently free of man-made barriers and industrial pollution to allow passage of shad to their upper reach spawning habitats, which are concentrated on the Upper Delaware.

Recreational opportunities are abundant in the Upper Delaware area. The river is one of the most outstanding canoeing rivers in the Northeast, combining consistent water flows, high scenic quality, and proximity to metropolitan areas. Because of its combination of diverse habitats, the area also offers excellent recreational fishing and hunting opportunities. Many also visit the area for sightseeing, swimming, and other activities.

This rural **area** is readily accessible to approximately 31,750,000 people who live within a 150-mile radius of the river. These outstanding resource values, and the steadily increasing recreational use of the river, are among the reasons the U.S. Congress designated 73.4 miles of the Upper Delaware River as part of the National Wild and Scenic Rivers System through the National Parks and Recreation Act of 1978 (P.L. 95-625). The Upper Delaware legislation requires that the Secretary of the Interior, in cooperation with the Delaware River Basin Commission, the Citizen's Advisory Council, the Commonwealth of Pennsylvania, the State of New York and their concerned political subdivisions, develop and approve a river management plan that shall set forth:

(A) a map showing detailed final landward boundaries, the upper and lower termini of the corridor, and the specific segments of the river classified as scenic and recreational, to be administered in accordance with such classifications;

(B) a program for the management of existing and future land and water use, including the application of available management techniques;

(C) an analysis of the economic and environmental costs and benefits of implementing the management plan, including any impact of the plan upon the revenues and costs of local government;

(D) a program providing for coordinated implementation and administration of the plan with proposed assignment of responsibilities to the appropriate governmental unit at the Federal, regional, State and local levels; and

(E) such other recommendations or provisions as shall be deemed appropriate to carry out the purposes of Section 704(c)(2) of the Act.

C. Legislative and Planning History

The Upper Delaware River was one of the original twenty-seven rivers designated for study upon passage of the Wild and Scenic Rivers Act by Congress in 1968 (P.L. 90-542, 16 U.S.C. 1271). A federal study team led by the Bureau of Outdoor Recreation (BOR) began its evaluations in 1969, and a draft river qualification study and draft environmental impact statement was released in February 1974. Concern over the level of federal land acquisition arose during this time, which resulted in a substantial redefinition of the study's recommendations concerning the boundary, land acquisition, and local involvement in the river's management. Further drafts were produced in October 1974, before a river study and a final environmental impact statement were released in July 1976. The final study and statement attempted to resolve these concerns by recommending a wider boundary and increased reliance on the use of local land use controls for conservation instead of federal acquisition.

A proposal for designation as a National Scenic and Recreational River was included in a Presidential environmental message to Congress dated May 10, 1977. The proposed designation was the subject of Congressional hearings during 1977 and 1978. A 73.4 segment of the river was added to the Wild and Scenic Rivers System through the National Parks and Recreation Act of 1978 (P.L. 95-625).

The Upper Delaware legislation specified that the Secretary of the Interior implement interim management guidelines during the time that final land and water use guidelines and a River Management Plan were being written. The National Park Service, the Secretary's designee, began interim management in 1979. An intergovernmental planning team was established in June 1980 to begin preparation of the guidelines and management plan.

General Land and Water Use Guidelines were published in the Federal Register which were effective October 13, 1981. A draft River Management Plan and Environmental Impact Statement were circulated for review in October 1982, and public hearings were subsequently held.

The hearings and comments on the plan were highly critical of the proposal, resulting in substantial revisions of the draft. This revised draft management plan and environmental impact statement were circulated for review in October 1983. Local opposition to the plan grew throughout this period, and a series of locally sponsored public meetings were held in the early months of 1984. The issues and concerns generated at these meetings caused the Conference of Upper Delaware Townships (COUP), an ad hoc association of elected officials of the river towns, to request that a new draft plan be prepared which would be more sensitive to local concerns. The National Park Service agreed. Work on the revised plan under the direction of COUP began in August 1984.

The proposed River Management Plan was prepared cooperatively by COUP, the National Park Service, the State of New York and the Commonwealth of Pennsylvania, the Delaware River Basin Commission, the Upper Delaware Citizen's Advisory Council and other public and private interests. COUP formed three committees - Plan Oversight, Land Use Guidelines, and Water Use Guidelines - and hired consultants to assist in the preparation of the proposed plan. The membership of these committees represented a broad range of local landowners, commercial interests, local, state, regional and federal governmental agencies, as well as local and national conservation and recreation organizations. This DEIS will evaluate the proposed plan, along with other reasonable alternatives, for potential impacts on the natural, cultural and social resources of the area.

CHAPTER II - ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. Introduction

This section of the DEIS describes the proposed action and two alternatives, and then evaluates and compares the environmental consequences of each. The proposed action (Alternative 1) involves approval of the River Management Plan by the Secretary of the Interior. Alternative 2 involves continuation of current National Park Service interim management without a Management Plan. Alternative 3 involves approval by the Secretary of a River Management Plan having no intergovernmental management council and assigning to the National Park Service additional management responsibilities. Possible alternatives considered but not selected for analysis are discussed in Chapter V. A summary of the major alternatives can be found at the end of Section B.

B. Description of Alternatives

1. Alternative 1: Implement the River Management Plan and Guidelines (Proposed Action)

Under the proposed action, the River Management Plan (RMP) and revised Land and Water Use Guidelines would be implemented by an Upper Delaware Management Council. The Council would be composed of representatives from each river corridor town, the National Park Service, the State of New York, the Commonwealth of Pennsylvania, and the Delaware River Basin Commission. The RMP and the Guidelines also assign responsibilities to each of the above parties.

The Conference of Upper Delaware Townships (COUP) took a lead role in preparing the proposed RMP and Guidelines. Fourteen of the fifteen river corridor towns participated on COUP. Representatives from the Commonwealth of Pennsylvania, the State of New York, the National Park Service, and the Delaware River Basin cooperated with COUP in formulating the RMP and Guidelines.

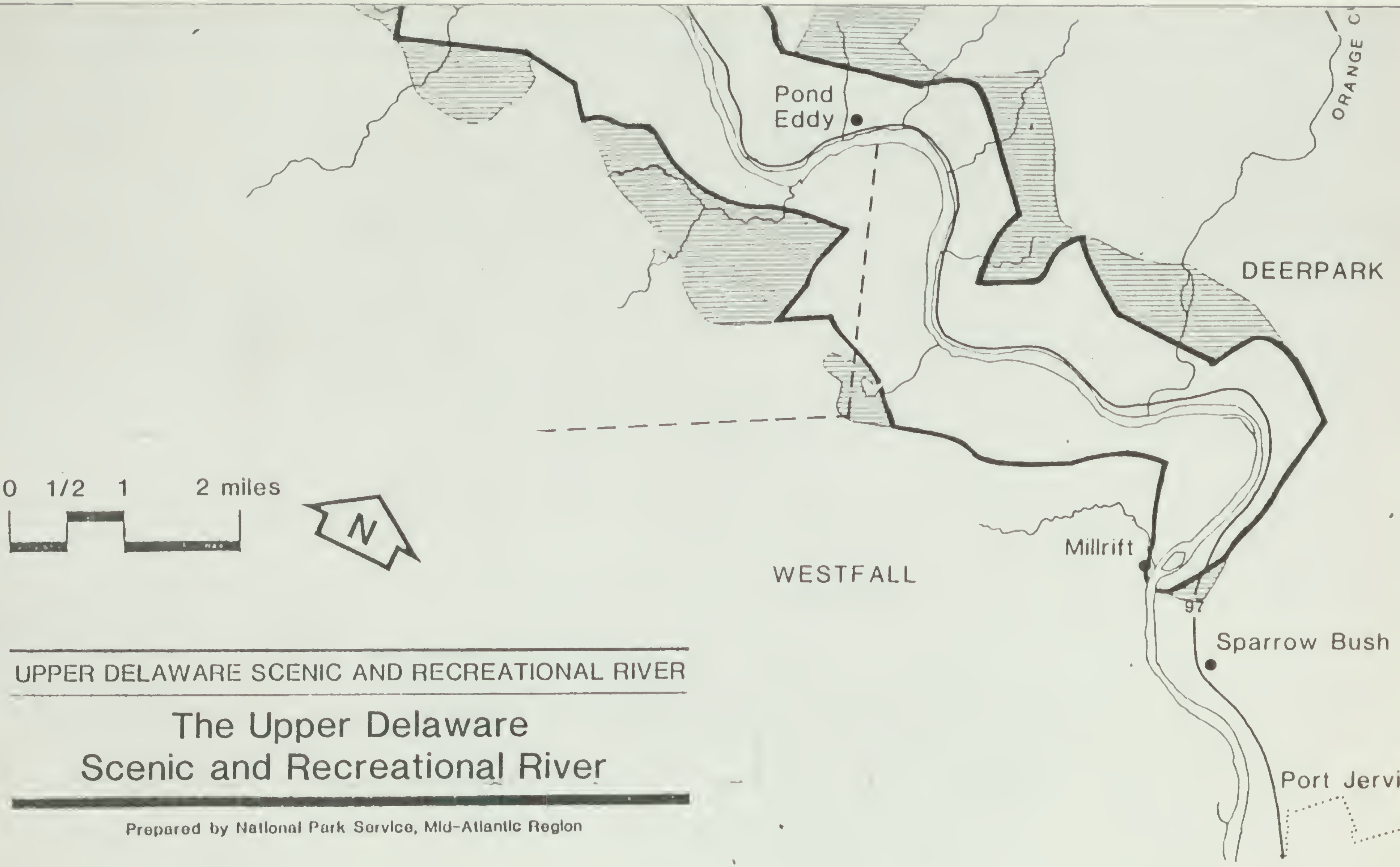
For the purpose of the environmental analysis contained in this EIS (see Chapter IV), it is assumed that over the course of the planning period twelve of the fifteen river corridor towns would manage their river resources and develop and adopt land use regulations consistent with the RMP and the Guidelines. This number was derived by assuming that those towns which do not currently have local zoning and which have not sought financial assistance [under the provisions of Section 704(e) of the Upper Delaware legislation] for developing local zoning would not manage their river resources in a manner consistent with the RMP and Guidelines.

River Corridor Boundary

A boundary for the river corridor would be established that includes the segment of the Upper Delaware River from the confluence of the East and West branches below Hancock, New York, to the existing railroad bridge immediately downstream of Cherry Island in the vicinity of Sparrow Bush, New York for a total river corridor length of 73.4 miles. Under this alternative, the boundary would encompass a total of 56,095 acres, and would include those adjacent lands from which runoff drains directly into the Delaware River. In addition, the boundary line would be drawn across tributary valleys at the nearest recognizable high points closest to each stream, which may be ridgelines, peaks, or topographic promontories (see Map 2).

River Classifications

Three recreational and two scenic segments would be established within the river corridor (see Map 2). These segments have been defined based on existing types and intensity of land use and development within the river corridor, in accordance with the definitions of scenic and recreational in the Act. The RMP also identifies seventeen hamlet areas. Levels and types of development for the scenic and recreational segments, as well as for hamlet areas, have been defined in the Land and Water Use Guidelines, including compatible, incompatible, and conditionally compatible uses.



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

The Upper Delaware Scenic and Recreational River

Prepared by National Park Service, Mid-Atlantic Region

THE UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

MAP 2

Natural Resource Conservation

Resource conservation would occur through use of existing federal, state and local laws, as well as through conformance with the RMP and the Land and Water Use Guidelines. The Management Council would be responsible for reviewing proposed developments which could result in adverse impacts on the river corridor. These would include major subdivisions, river-related recreational use projects, projects involving the use of central sewage or water services, projects constructed or operated by government agencies, and projects subject to conditional use procedures under local ordinances. The Council review would provide local governments, and state and federal agencies, with recommendations for improving proposed projects so as to better protect the river corridor.

The Land and Water Use Guidelines would foster natural resource conservation by providing suggested methods for protection of river resources through local land use regulations, as well as through consistent state and federal actions. Existing land uses would not be affected. The Guidelines would serve as the basis for determining whether local plans, laws, and ordinances adequately meet the objectives of the Wild and Scenic Rivers Act and the Upper Delaware Special Provisions. The Guidelines were developed to closely reflect the legislative objectives. They contain six major principles based on the Department of the Interior's "Guidelines for Eligibility, Classification and Management of River Areas." These principles are:

A. Maintain the high water quality found in the Upper Delaware River.
B. Provide for the protection of the health, safety, and welfare of visitors and residents while also providing for the protection and preservation of natural resources.
C. Provide for recreational and other public uses while protecting the Upper Delaware as a natural resource.

D. Provide for the continuation of agricultural and forestry uses.

E. Conserve river area resources.

F. Maintain existing patterns of land use and ownership.

For each of the above principles, the Guidelines set out one or more objectives. Among the objectives which would have the greatest affect on the river corridor's environment are:

1. Limit soil erosion and sedimentation from construction on steep slopes.
2. Maintain natural cover to control stormwater runoff, limit flooding, protect groundwater supplies and provide erosion control.
3. Protect special erosion hazard areas along riverbanks.
4. Protect special erosion hazard areas along ridgelines.
5. Limit pollution problems from septic systems located on poor soils.
6. Provide for light and air and maintain an uncluttered landscape through: adequate separation of principal structures, limiting the height of principal structures, and requiring adequate setbacks of principal structures from highways.
7. Prevent unnecessary sign proliferation, particularly on the riverfront.
8. Encourage both private and public agencies that are recreational providers to locate intensive use recreation facilities outside of undeveloped or "Scenic" segments of the river corridor.
9. Provide for the use of sound timber practices within the corridor.
10. Ensure that traditional resource extraction operations are permitted, but consistent with the protection of the public, health, safety, and welfare.
11. Limit housing density and intensity of uses with consideration to the existing character of the river corridor.

The Guidelines provide alternative ways by which a town could conform to each of the objectives. The choice would be up to the town. In addition, the Upper Delaware legislation does not mandate local conformance with the Guidelines. The legislation, however, does authorize the Secretary of the Interior to use condemnation within those towns whose local land use regulations fail to substantially conform to the Guidelines, provided that the lands to be acquired are clearly and directly required for protection of the objectives of the legislation.

The proposed RMP specifies the procedures which the Department of the Interior would need to follow before using condemnation. These procedures include: initial review by the Management Council of local government conformance to the RMP and to the Guidelines (lack of conformance is a legislatively mandated prerequisite to the use of condemnation); initial review by the Management Council of whether a proposed land use would pose a "clear and direct threat" to the corridor's resources; the opportunity for the Management Council, the town, or the state to first attempt to alleviate the threat; review by the Management Council to ensure that condemnation is the last available resort to prevent the threat; and concurrence by the Management Council that the involved parcel be acquired (such concurrence is required by the RMP where a "clear and direct threat" exists and there are no means available other than condemnation to alleviate the threat). Landowners agreeing to conform to the provisions contained in the Guidelines would also receive assurance from the Secretary of the Interior that their land would not be subject to condemnation.

To meet the resource protection purposes of the Wild and Scenic Rivers Act and the Upper Delaware Special Provisions, the Land and Water Use Guidelines also specify compatible, incompatible, and conditionally compatible land uses. These vary depending on whether the proposed use is located in a scenic or recreational segment, or in a hamlet area. See Map 2. Local government conformance to the Guidelines would include consistency of local land use regulations with the Guidelines' listing of compatible, incompatible, and conditionally compatible land uses.

Uses which are listed in the Guidelines as incompatible with the resource conservation objectives of the Upper Delaware legislation include:

In scenic segments only: recreational vehicle campgrounds and other intensive use commercial recreational facilities; commercial development (unless listed as a compatible or conditionally compatible use); public recreational facilities; motels and hotels; and institutional uses (unless listed as a conditionally compatible use).

In scenic and recreational segments only: RV parks; mobile home parks; industrial uses; and major commercial development.

In all river corridor areas (scenic and recreational segments, and hamlets): heavy industrial uses; junkyards; major surface mining operations; subsurface mining; impoundments; channel modification; major airports, marinas; power generating stations; landfills; major electric lines; paved 4-lane roads and bridges; and ice breaking structures.

River Recreational Use Management

The National Park Service has been managing river recreation use and providing information to visitors along the Upper Delaware since 1980. Under the proposed action, the National Park Service would continue that role (as further described in Chapter III/D.2).

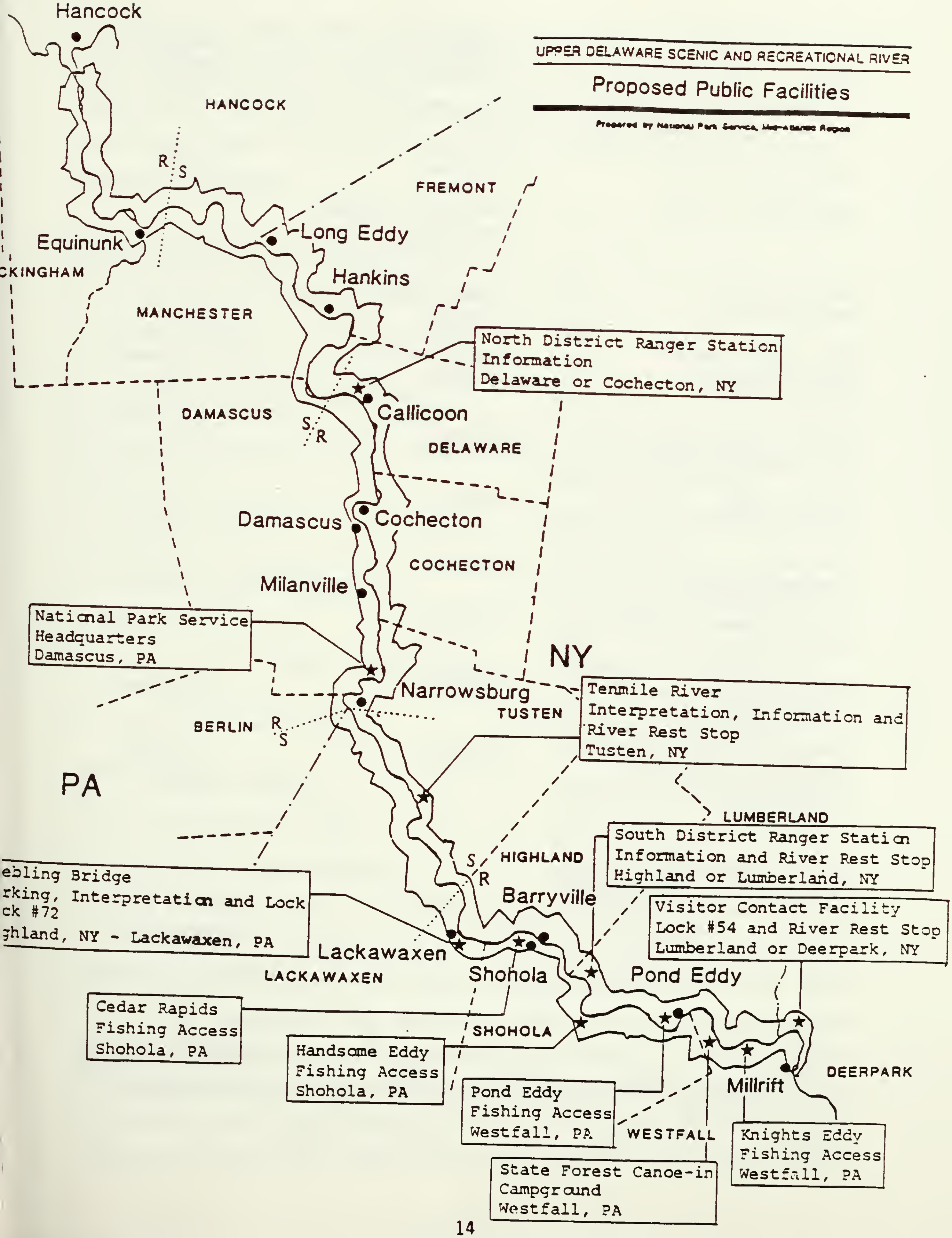
The primary providers of river boating opportunities would continue to be the canoe liveries. Watercraft rental businesses would be authorized to operate in the river corridor through commercial use licenses issued by the National Park Service. River use safety standards and procedures to ensure user safety are defined in the license.

The proposed action does not provide for any limitations on river use at this time. There is a multi-year recreation use study underway which would provide information to the Upper Delaware Management Council to help it determine whether existing or increased river use would degrade environmental quality, create safety hazards for river users or result in violations of the property rights of riparian landowners. Based on this study and on monitoring of river use, appropriate measures would be recommended by the Management Council. Options might include establishing water use performance guidelines for water recreational uses and establishing voluntary limits on numbers of commercial watercraft. If needed, more stringent options such as a locally-administered registration system or a permit system that allocates use would be considered by the Management Council.

Public Facility Development

Proposed new and/or expanded public facilities (see Map 3) within the river corridor would include an NPS visitor contact/interpretation center, two NPS district ranger stations, three NPS interpretation sites, three NPS river rest stops, two NPS parking areas at the Roebling Bridge, four NPS-leased fishing access areas, and one Commonwealth of Pennsylvania canoe-in campground. The location and approximate acreage of these facilities are as follows:

Site	**Approx. Location**	**Approx. Acres**
North District Ranger Station	Delaware or Cochecton	3-5
Archeological Site at Ten Mile River	Tusten	45
River Rest Stop at Ten Mile River	Tusten	part of above
NY Parking for Roebling's Bridge and Emergency Access	Highland	1-2



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Proposed Public Facilities

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Site	Approx. Location	Approx. Acres
PA Parking for Roebling's Bridge and Emergency Access	Lackawaxen	1-2
D&H Canal Lock #72	Highland	1-2
D&H Canal Lock #54	Deerpark (included in visitor contact facility)	
South District Ranger Station	Lumberland or Highland	3-5
River Rest Stop at South District Ranger Station	Lumberland or Highland	included in above
Visitor Contact Facility and River Rest Stop	Deerpark	70
Knights Eddy Fishing Access	Westfall	2 (lease)
Pond Eddy Fishing Access	Westfall	2 (lease)
Cedar Rapids Fishing Access	Shohola	2 (lease)
Handsome Eddy Fishing Access	Shohola	2 (lease)
Commonwealth of Pennsylvania Canoe-In Campground	Westfall	on State Forest land

Cultural Resource Management

Historic and archeological resources that are in private ownership would remain in private ownership. Those in public ownership at the present time, and those that become publicly owned in the future, would be afforded the protection of existing federal and state laws, regulations and executive orders. In addition, NPS would provide technical assistance to property owners, local governments, and historic preservation organizations.

The Management Council would coordinate cultural resource protection. Towns would consider forming cultural resource or historic district commissions. The states and NPS would provide information and assistance on a request basis for historic preservation, rehabilitation, and National Register nominations.

Key sites would be managed as follows:

1. Archeological site at Ten Mile River	NPS
2. Roebling Bridge (Delaware Aqueduct) and Toll House	NPS
3. Delaware & Hudson Canal Locks 72 and 54	NPS
4. Zane Grey House	Private (adaptive reuse with NPS assistance)
5. Arlington Hotel	Private (NPS lease of office space)
6. Delaware and Hudson Canal	Private (voluntary cooperative agreements between NPS and property owners)
7. Congregational Church and graveyard, Barryville	Private (NPS cooperative agreement)
8. Tusten Settlement Church	Private (NPS cooperative agreement)
9. St. Joseph's Seminary	unspecified (adaptive reuse)
10. Callicoon Railroad Depot	unspecified (adaptive reuse)
11. Lackawaxen Aqueduct Abutment	unspecified (voluntary maintenance)
12. Fort Delaware	Sullivan County
13. Minisink Battleground	Sullivan County

Overall Management

The Management Council would review, coordinate and provide direction for all aspects of plan implementation, and would monitor town government conformance with the 1985 Land and Water Use Guidelines. The Council would be assisted by the Citizen's Advisory Council, which would continue its present role of encouraging public involvement. Towns would continue to be responsible for managing land use, with limited review and recommendation responsibilities given the Management Council.

Similarly, state and federal agency actions would be reviewed by the Council for consistency with the RMP and the Guidelines. The Management Council would serve as an intergovernmental forum for seeking to resolve issues relating to the Upper Delaware.

The Management Council, through a contract with the Secretary of the Interior, would be responsible for initial review of local plans, laws and ordinances to determine conformance with the RMP and the Guidelines. The Council would also monitor enforcement of local land use controls to ensure continued conformance. As already noted, the Council would review major proposed developments as well as certain other projects having the potential for adversely impacting river area resources. Also, as previously noted, the Council would have review responsibilities before federal condemnation could be exercised.

While the Management Council would play a principal role in overall management, the towns, states, NPS and DRBC would also have specific management responsibilities of their own. Of particular importance, the States and the DRBC would develop and adopt policies to ensure that existing regulatory, administrative, and funding programs are consistent with and supportive of the proposed action. Similarly, the NPS would work with the Council to ensure that other federal agency actions are consistent with the RMP and the Guidelines. The towns, as noted, would continue to be responsible for local land use decisions. The Citizen's Advisory Council would be responsible for, among other things, encouraging maximum public involvement in the implementation of the RMP and serving as a forum to hear individual concerns about the RMP and its implementation.

2. Alternative 2: Maintain Status Quo (No Action)

This alternative describes continuation of current NPS interim management, which would occur if a plan were not implemented to manage land and water use in the corridor. It also serves as a baseline for existing conditions, from which the other two alternatives are compared and analyzed in terms of environmental impacts. Adoption of this alternative, however, would result in a failure to conform to the mandate of the Upper Delaware Special Provisions, which calls for adoption of a river management plan (Section 704(c)).

River Corridor Boundary

The 1978 legislated boundary delineating 79,435 acres would remain in effect. See Map 2.

River Classification

The scenic and recreational segments and hamlet areas as defined in the proposed plan would remain. See Map 2.

Natural Resources Conservation

Resource conservation would be a local responsibility and would depend primarily on the enforcement of existing laws. The 1985 Land and Water Use Guidelines would be used by NPS to evaluate threats to resources. The Secretary of the Interior would be authorized to use condemnation within towns found not to be in substantial conformance with the Land and Water Use Guidelines, provided that the land to be acquired were clearly and directly required for protection of the objectives of the Upper Delaware Special Provisions. The Secretary would have sole and complete responsibility for determining both whether a town were in substantial conformance with the Guidelines and whether the involved parcel were clearly and directly required to protect the resources of the Upper Delaware. Acquisition of land, however, would not likely exceed 450 acres over the course of the planning period, given past trends in acquisition and the likelihood that little federal money would be appropriated for land acquisition.

For the purpose of the environmental analysis contained in this EIS (see Chapter IV), it was assumed that over the course of the planning period no major modifications to local land use regulations would occur. Past trends toward increased use of local zoning would be counterbalanced by decreased incentives for local zoning given the absence of a Management Plan and a Management Council, and given the likelihood that little or no federal financial assistance would be available for the development or revision of local ordinances and comprehensive plans.

River Recreational Use Management

NPS would continue its present river management activities (as described in Chapter IV) at 1985 levels contingent upon available funding. NPS would continue to license livery operations. Upon completion of a multi-year recreation use study, NPS would decide appropriate future management actions. Although no immediate limits to recreation use levels would occur, future limits on use would be possible.

Public Facility Development

Existing public river-related facilities (as listed in Chapter III/D) would remain. No new facilities would be developed, managed, or acquired by NPS.

Cultural Resource Management

The Roebling Bridge would continue to be managed by NPS. NPS would also continue to lease office space in the Arlington Hotel. Other sites would be managed under state and local programs. Properties on (or eligible for) the National Register would be protected from adverse federal actions. NPS would continue to assist landowners and local governments with National Register nominations.

Overall Management

NPS would continue its responsibilities (as described in Chapter III/D.2) for river recreation management and would continue to identify threats to resources. NPS would have authority to acquire land within towns which the Secretary of the Interior finds not to be in substantial conformance with the Land and Water Use Guidelines, provided that the Secretary finds that the acquisition of such land is clearly and directly required for protection of the objectives of the Upper Delaware legislation. Towns would remain responsible for local land use regulation. No formal intergovernmental coordinating body or mechanisms would be developed. The Citizen's Advisory Council would continue its present role of encouraging public involvement in planning and management decisions relating to the Upper Delaware.

3. Alternative 3: Implement a Modified RMP

The River Management Plan, as described under Alternative 1, would be modified before adoption by the Secretary of the Interior. The modifications would reflect the fact that there would be no Upper Delaware Management Council due to lack of local support. Instead, the responsibilities and functions assigned the Council in the RMP and Guidelines (as described in Alternative 1) would be assumed by the National Park Service.

River Corridor Boundary

The boundary would be the same as under Alternative 1, encompassing 56,095 acres. See **Map** 2.

River Classification

The same scenic and recreational segments and hamlet areas under Alternative 1 would be used. See Map 2.

Natural Resource Conservation

The 1985 Land and Water Use Guidelines would be used by the Secretary of the Interior to evaluate threats to resources. Resource conservation would occur primarily through enforcement of existing federal, state and local laws. For the purpose of the environmental analysis contained in this EIS (see Chapter IV), it is assumed that over the course of the planning period those ten towns which either currently have zoning specifically linked to protection of the natural resources of the Upper Delaware river corridor or which have actively sought NPS assistance for developing zoning provisions aimed at protecting the river corridor would manage their river resources in a manner consistent with the RMP and the Guidelines.

The Secretary of the Interior would be authorized to use condemnation within towns found not to be in conformance with the RMP or the Land and Water Use Guidelines, provided the land to be acquired were clearly and directly required for protection of the objectives of the Upper Delaware Special Provisions. Up to 7340 acres could be acquired in this manner. The Secretary would have sole and complete responsibility for determining conformance with the RMP and Guidelines and for determining whether the land to be acquired were clearly and directly required.

River Recreational Use Management

NPS would continue its livery licensing program and continue its present management program (which focuses on education, information and enforcement of regulations). Based on the NPS recreation use study findings and on monitoring data, NPS would implement, as needed, a range of management actions as outlined in its modified RMP. Options might include continuing the existing management program, requiring concession permits, or establishing concession contracts.

Public Facility Development

New facilities would be the same as under Alternative 1. See Map 3.

Cultural Resource Management

Cultural resource sites proposed for NPS acquisition or management under Alternative 1 would be acquired or managed by NPS under the modified RMP as well. Other sites would be managed under state or local ordinances. NPS would take steps to acquire historic buildings, sites or structures to avert major threats to these resources. NPS would continue to assist with National Register nominations.

Overall Management

NPS would implement the modified RMP, and would have responsibility for monitoring land use and determining conformance with the Guidelines and the RMP for the Secretary. NPS would work directly with federal and state agencies and local governments to encourage their conformance to the RMP and Land and Water Use Guidelines to the fullest extent possible. Towns would be responsible for bringing zoning ordinances into conformance, while the Citizen's Advisory Council would be responsible for, among other things, encouraging maximum public involvement in the implementation of the RMP and for serving as a forum to hear individual concerns and grievances about the RMP and its implementation.

TABLE II.1
SUMMARY OF MAJOR ALTERNATIVES

Alternative 1 Proposed Action: IMPLEMENT THE RMP	Alternative 2 No Action: MAINTAIN STATUS QUO	Alternative 3 IMPLEMENT MODIFIED RMP
Summary Description The River Management Plan and revised Land and Water Use Guidelines would be adopted by town governments, PA and NY, the Delaware River Basin Commission and the Department of the Interior. An Upper Delaware Management Council would be established to coordinate implementation of the plan. Most towns will participate on the Management Council, along with the states, DRBC, and NPS, and be consistent with the Management Plan and Land and Water Use Guidelines.	Summary Description NPS would continue its current role in river recreation management by funding Scenic and Recreational River operations. There would be no RMP, no Upper Delaware Management Council, and no plan for protection of threatened resources. The revised Land and Water Use Guidelines would be adopted. Assumes current land use trends would continue and resource protection would depend primarily on enforcement of existing laws.	Summary Description The River Management Plan would be modified before adoption by the Secretary of the Interior. The revisions would reflect the fact that no Upper Delaware Management Council would be established and NPS would perform the responsibilities assigned to the Council in the proposed action. NPS management would stress protection of threatened resources. Assumes current land use trends would continue and resource protection would depend primarily on enforcement of existing laws. The revised Land and Water Use Guidelines would be adopted.
Boundary Acreage 56,095 acres, as proposed in the RMP, based on river resource protection criteria.	Boundary Acreage 79,435 acres, as provided in the 1978 legislation.	Boundary Acreage Same as the proposed action.
Natural Resource Conservation Resource conservation would occur through enforcement of existing laws and through state and local conformance with the revised Land and Water Use Guidelines. The Guidelines outline principles and objectives for guiding new development and identify compatible, incompatible, and conditionally compatible uses. Condemnation could be used in nonconforming towns to remedy clear and direct threats to the corridor's natural resources, but only as a last resort and subject to prior review by the Management Council. The Council would make the initial determination of town conformance with the RMP and Guidelines. Landowners agreeing to conform to the Guidelines would also receive assurances from the Secretary of the Interior that their land would not be subject to condemnation.	Natural Resource Conservation Resource protection would primarily depend on the enforcement of existing laws. Condemnation could be used in towns whose local land use regulations failed to conform to the Land and Water Use Guidelines to remedy clear and direct threats to the corridor's natural resources. The Secretary of the Interior would have complete responsibility for determining both town conformance with the Guidelines and whether a clear and direct threat were present. A limited amount of acreage could be acquired to avert clear and direct threats to resources, given sufficient funds.	Natural Resource Conservation Resource conservation would primarily depend on enforcement of existing laws. Condemnation could be used in towns whose local land use regulations failed to conform to the modified RMP or Land and Water Use Guidelines to remedy clear and direct threats to the corridor's natural resources. The Secretary of the Interior would have complete responsibility for determining both town conformance with the RMP and Guidelines and whether a clear and direct threat were present. Up to 7340 acres could be acquired to avert such threats to resources.

TABLE II.1 (continued)
SUMMARY OF MAJOR ALTERNATIVES

Alternative 1 Proposed Action: IMPLEMENT THE RMP	Alternative 2 No Action: MAINTAIN STATUS QUO	Alternative 3 IMPLEMENT MODIFIED RMP
Cultural Resource Management NPS would enter into cooperative agreements with state and local governments and private groups in order to appropriately manage cultural resource sites. NPS would use voluntary agreements with property owners to ensure protection of privately owned sites. NPS would continue to assist local governments, historical societies and individuals with nominations of sites and districts to the National Register of Historic Places.	Cultural Resource Management Sites currently under NPS management would continue to be so managed. NPS would not enter into cooperative agreements for management of other sites. NPS would continue to assist National Register nominations.	Cultural Resource Management Cultural resource sites presently managed by NPS would continue under NPS management. NPS would seek to acquire historic building, sites or structures, if necessary, to avert major threats to these resources. NPS would continue to assist with National Register nominations.
Recreation Management The NPS would continue its livery licensing program and further develop boating safety standards. The current management program, which focuses on information and education, would continue, as would NPS safety patrols. NPS would conduct a two-year recreation use study to provide data for the Management Council to use in deciding what future management actions may be appropriate. A permit system, if needed, would be implemented by the Management Council.	Recreation Management NPS would continue licensing livery operations. Existing informational and education programs and safety patrols would continue. Based on the NPS recreation use study findings, NPS would implement, if needed, a range of management actions.	Recreation Management NPS would continue its livery licensing program and develop boating safety standards. The present management program which focuses on education and information, would continue, as would NPS safety patrols. Based on the NPS recreation use study findings and monitoring data, NPS would implement management actions as outlined in its modified RMP. Options might include continuing the existing management program, requiring concession permits, or establishing concessions contracts.
Existing public river-related operations include 1 NPS headquarters and 2 ranger stations, 1 NPS information center, 5 information kiosks, 7 public river access points, 2 of which are co-managed by NPS, and the Roebling Bridge.	Existing public facilities would be maintained.	Existing public facilities would be maintained.
Other public facilities and services within the corridor include 2 county parks, 2 state forests, 2 state gamelands, and 2 road-side rest areas/ scenic overlooks.		

TABLE II.1 (continued)
SUMMARY OF MAJOR ALTERNATIVES

Alternative 1 Proposed Action: IMPLEMENT THE RMP	Alternative 2 No Action: MAINTAIN STATUS QUO	Alternative 3 IMPLEMENT MODIFIED RMP
Recreation Management (continued) Proposed new and/or expanded facilities include an NPS visitor contact/interpretation center, 2 district ranger stations with river access, 3 new interpretation sites, 3 river rest stops, 2 new parking areas at the Roebling Bridge and 4 fishing access sites (leased by NPS if possible).	Recreation Management (continued) No new or expanded facilities would be developed.	Recreation Management (continued) Proposed facilities would be the same as under Alternative 1.
NPS would acquire approximately 130 acres of land as identified in RMP to support visitor services and facilities.	NPS would not acquire any additional land for recreation management purposes.	Acquisition for recreation management purposes would be the same as under Alternative 1.
Management Structure and Responsibilities The Management Council would serve as an intergovernmental forum. It would coordinate and provide overall direction for Plan implementation, and would monitor town government conformance with the Plan and the Guidelines. Towns would remain responsible for local land use decisions. The Council, however, would review certain categories of proposed land development for the purpose of recommending to the involved town(s) measures for improving the proposed developments to better protect the river corridor.	Management Structure and Responsibilities No formal intergovernmental body would be established. Towns would remain responsible for local land use decisions. NPS would monitor town government conformance with the Guidelines.	Management Structure and Responsibilities This would be the same as under Alternative 2 except that NPS would monitor conformance with both the Guidelines and the modified RMP.
The Citizens Advisory Council would encourage maximum public involvement in plan implementation and would serve as a forum to hear individual concerns about the RMP and its implementation.	The Citizens Advisory Council would encourage maximum public involvement in planning and management decisions relating to the Upper Delaware.	This would be the same as under Alternative 1.

C. Assumptions Regarding the Land Use Guidelines

In order to assess the impacts of the three alternatives, it was necessary that the EIS team make assumptions about the level of town conformance which would occur and what actions they would likely take in response to the Land Use Guidelines.

The Guidelines themselves contain a series of objectives designed to meet the goals of the Upper Delaware legislation. Each objective, in turn, outlines one or more alternative way by which a town can satisfy the particular objective. For purposes of this EIS, the study team decided to focus on those objectives which were most closely related to the major environmental topics being addressed in the EIS. These selected objectives (taken from the Land Use Guidelines) are listed in Table II.2, Column 2. Table II.3 shows major incompatible uses as listed in the Land Use Guidelines.

The EIS team next analyzed existing local zoning codes to determine which of the several alternative provisions in the land use guidelines listed for a particular objective number were already reflected in town zoning codes. For analytic purposes, the EIS team concluded that provisions already being used by the greatest number of towns would be the ones most likely to be used by the other towns in the future. The EIS team's assumptions regarding the level of town government conformance with the Guidelines under each alternative are set out in Section B of this Chapter.

D. Environmental Consequence

Table II.4, Summary Comparison of Environmental Consequences, highlights the findings of the environmental impact analysis. Each topic was assessed for each alternative based on detailed analysis of available data. Chapter IV describes the specific impacts by topic.

Table II.2 - Selected Principles and Objectives Contained in the Land Use Guidelines: Assumptions

Principle	Major Objective	Likely Action	Alternative 1: Proposed Plan		Alternative 2: Status Quo		Alternative 3: Modified Plan	
			# of Towns*	% of Corridor Acreage	# of Towns*	% of Corridor Acreage	# of Towns*	% of Corridor Acreage
A. Maintain water quality	Limit soil erosion on steep slopes	Conditional use review of structures on slopes >15%	12	85	5	35	10	75
	Maintain natural cover	10% (or no more than 12,000 sq. ft.) lot coverage	12	85	7	50	10	75
	Protect erosion hazard areas	Conditional use review within 100' setback from river	12	85	5	35	12	75
	Protect special erosion hazard areas along ridgelines	Ensure buildings are not located close to the ridgeline	12	85	3	20	12	75
	Limit pollution from septic system	2 acre minimum lot size outside of hamlets	12	85	9	65	12	75
B. Provide for the protection of health and safety and welfare and protection of natural resources	Provide for light and air	35' maximum bldg. height	12	85	8	55	12	75
	Prevent unnecessary sign proliferation	Generally prohibit off premises signs	12	85	7	40	11	80
D. Provide for the continuation of agricultural and forestry uses	Promote for sound timber practices	Prohibit clear cuts over 2 acres	12	85	4	30	10	75
F. Maintain existing patterns of land use and ownership	Limit housing density and intensity	Special zoning district for corridor with minimum 2 acre lot size	12	85	8	60	10	75

* Number of river corridor towns (of a total of 15) which would likely adopt land use regulations consistent with the action listed in Column 3.

Table II.3 - Major Incompatible Uses as Listed in the Land Use Guidelines: Assumptions

	Alternative 1: Proposed Plan		Alternative 2: Status Quo		Alternative 3: Modified Plan	
	Number of Towns*	% of Corridor Acreage	Number of Towns*	% of Corridor Acreage	Number of Towns*	% of Corridor Acreage
heavy industrial	13	90	11	70	13	85
junkyards	12	85	10	65	11	80
subsurface mining	12	85	7	50	11	80
major surface mining	12	85	7	50	11	80
landfills	12	85	10	70	12	85
airports	13	90	11	70	13	90
marinas	12	85	8	60	11	80
power plants	12	85	9	65	11	80

* Number of river corridor towns (of a total of 15) which would likely prohibit the listed major incompatible uses.

SUMMARY
TABLE II.4 - COMPARISON OF ENVIRONMENTAL CONSEQUENCES

	ALTERNATIVE 1 PROPOSED ACTION Implement River Management Plan and Guidelines	ALTERNATIVE 2 NO ACTION Maintain Status Quo	ALTERNATIVE 3 Implement Modified River Management Plan
FISHERIES	The overall quality of fisheries would be maintained.	The overall quality of fisheries would be maintained, however incompatible uses which may affect fisheries could occur in 35% of the corridor.	Same as Alternative 1.
WATER QUALITY	Existing water quality levels would be maintained throughout the corridor with some minor localized increases in nutrients, bacteria, and sediment.	Existing water quality levels would be maintained in most of the corridor.	Same as Alternative 1.
IMPORTANT SPECIES	Important species habitat would be largely protected in 85% of the corridor.	Important species habitat would be protected in about 35% of the corridor.	Important species habitat would be protected in about 75% of the corridor.
SCENIC RESOURCES	Scenic resources in 85% of the corridor would be maintained.	Scenic resources in 35%-60% of the corridor would be maintained through various local regulations.	Scenic resources in 75% of the corridor would be maintained.

SUMMARY
TABLE II.4 - COMPARISON OF ENVIRONMENTAL CONSEQUENCES (continued)

	ALTERNATIVE 1 PROPOSED ACTION Implement **River** Management Plan **and Guidelines**	ALTERNATIVE 2 NO ACTION Maintain Status Quo	ALTERNATIVE 3 Implement Modified River Management Plan
RECREATION	The proposed public facility development will adequately meet present and future needs. The quality of the experience will be maintained or enhanced.	Existing public access facilities would meet future needs, however the number of river rest stops and fishing access sites would be inadequate. The quality of the recreational experience would diminish.	Same as Alternative 1.
HISTORIC & ARCHEOLOGICAL RESOURCES	Cultural resources could be protected from major disturbances from incompatible uses in 85% of the corridor. NPS management of a number of sites would aid in their protection and/or restoration.	Impacts from new development or incompatible uses may adversely affect cultural resources. No new sites would be protected or managed by NPS.	Cultural resources would be protected from clear and direct threats from incompatible uses. NPS management of a number of sites would aid in their protection and/or restoration.
LANDOWNERS	Negligible effect from the acquisition of approximately 130 acres. Impacts from litter and trespass would decrease.	Negligible effect from possible acquisition of a small amount of land. Impacts from litter and trespass would increase.	Possible effect from acquisition of up to 7470 acres. Impacts from litter and trespass would decrease.
ECONOMIC	Land values would continue to increase. Costs to local governments are negligible.	Same as Alternative 1.	Same as Alternative 1.

III. AFFECTED ENVIRONMENT

A. Introduction

This section describes significant characteristics of the Upper Delaware's physical, biological, social, and economic environment. The purpose of describing the affected environment is to provide a baseline for analyzing the effects of the alternatives on various resources within that environment. Since this section relies heavily on existing sources of data, the level of detail reflects the level of available information. The proposed River Management Plan and Economic Analysis are incorporated by reference and contain detailed material that has not been duplicated in the main body of this Draft Environmental Impact Statement.

B. Regional Context

The Upper Delaware River is one of the few remaining examples of a free-flowing, relatively undeveloped river in the Appalachian Plateaus physiographic region. It delineates the Commonwealth of Pennsylvania's northeastern boundary with the State of New York.

The Delaware River originates in New York's Catskill Mountains. Its eastern and western branches meet at Point Mountain near Hancock, New York. The Upper Delaware Scenic and Recreational River begins here and flows southeasterly for 73.4 river miles to Sparrow Bush, just north of Port Jervis, New York (see Map 2). The river is bordered in New York by the eight towns of Hancock, Fremont, Delaware, Cochecton, Tusten, Highland, Lumberland and Deerpark (in Delaware, Orange and Sullivan Counties), and in Pennsylvania by the seven townships of Buckingham, Manchester, Damascus, Berlin, Lackawaxen, Shohola and Westfall (in Wayne and Pike Counties).

Rolling wooded hills ranging in elevation from 800 to 2,000 feet above sea level surround the river valley. The shape of the valley changes from narrow steeply cut walls and high bluffs to broad U-shaped sections with wide low-lying lands along the river. Hardwoods such as oak, beech, birch and maple are found in the northern portion of the corridor, while softwoods such as white pine and hemlock are more prominent in the southern portion.

Land areas in the Upper Delaware River corridor are rural in character, consisting of large expanses of forest broken by occasional farms, settlements, and low-lying marsh areas along the river. Over ninety percent of the land in the river corridor is in private ownership. Public land consists of state forests, local parks, and boating and fishing access sites. Most settlement is in the form of small hamlets; numerous dispersed homesites are also located throughout the valley. Commercial development is found primarily in the hamlets; however, canoe liveries and campgrounds are located at several points along the river shoreline. Within the corridor, the largest settled areas are at Narrowsburg and Callicoon, New York, with numerous smaller hamlets along both sides of the river.

The Upper Delaware Valley is rich in structures that reflect its history and cultural development. Prehistoric archeologic sites, historic architecture, and historic engineering and industrial sites are all abundant in the valley. Since the late 1700's, the Upper Delaware region has exported stone and timber for commercial purposes. In the mid 1800's canals were built to transport coal to New York City, followed soon thereafter by the railroads which eventually replaced them. With the advent of the railroads, the area began to attract vacationing city-dwellers. In the mid-1970's a major recreation and seasonal/retirement home economy began to develop.

Today recreationists travel to the Upper Delaware region from the New York City metropolitan area, northeastern Pennsylvania and the Philadelphia area, Binghamton, New York, and western New England metropolitan areas.

The Upper Delaware's accessibility to major metropolitan areas has been improved by the construction of Interstates 80, 81, 84 and New York's Highway 17. These highways bring the Upper Delaware within a two to four hour drive of the region's major population centers. The region is experiencing growth pressures from the expanding resort and tourism-based economies of the Catskills in New York and the Poconos in Pennsylvania, both of which border the river corridor.

C. Natural Resources

1. Physical Environment

The Upper Delaware River lies within the Catskill Mountains section of the Appalachian Plateau physiographic province. This physiographic region consists chiefly of upland areas composed of flat to very gently folded beds of sandstone, shale and conglomerates. The river and its tributaries have carved deep narrow valleys across the plateaus. The numerous wetlands and lakes found on the plateaus are characteristic of prior glaciation. The region's rolling hills vary in elevation from 800 to 2,000 feet and are characterized as a series of indistinct and irregular escarpments. Relief is generally between 300 and 500 feet, although it exceeds 700 feet in a few locations. As shown on Map 4, much of the river valley consists of steeply sloped land, with a gradient of over 15%.

There is a diversity of unique landforms throughout the river corridor, including the Delaware Gorge, which has been identified by the Pennsylvania Bureau of Topographic and Geologic Survey as one of the outstanding scenic geologic features in the state. The gorge begins above Matamoras and runs north throughout most of the river segment.

Glacial deposits cover the area at depths of up to 300 feet and are marked with ponds, lakes and wetlands. Bedrock outcrops are also abundant along the steep-sided valleys and within the riverbed. For much of its length the Upper Delaware River lies within a relatively narrow valley, widening slightly between Hancock and Callicoon.

2. Mineral and Soil Resources

Minerals

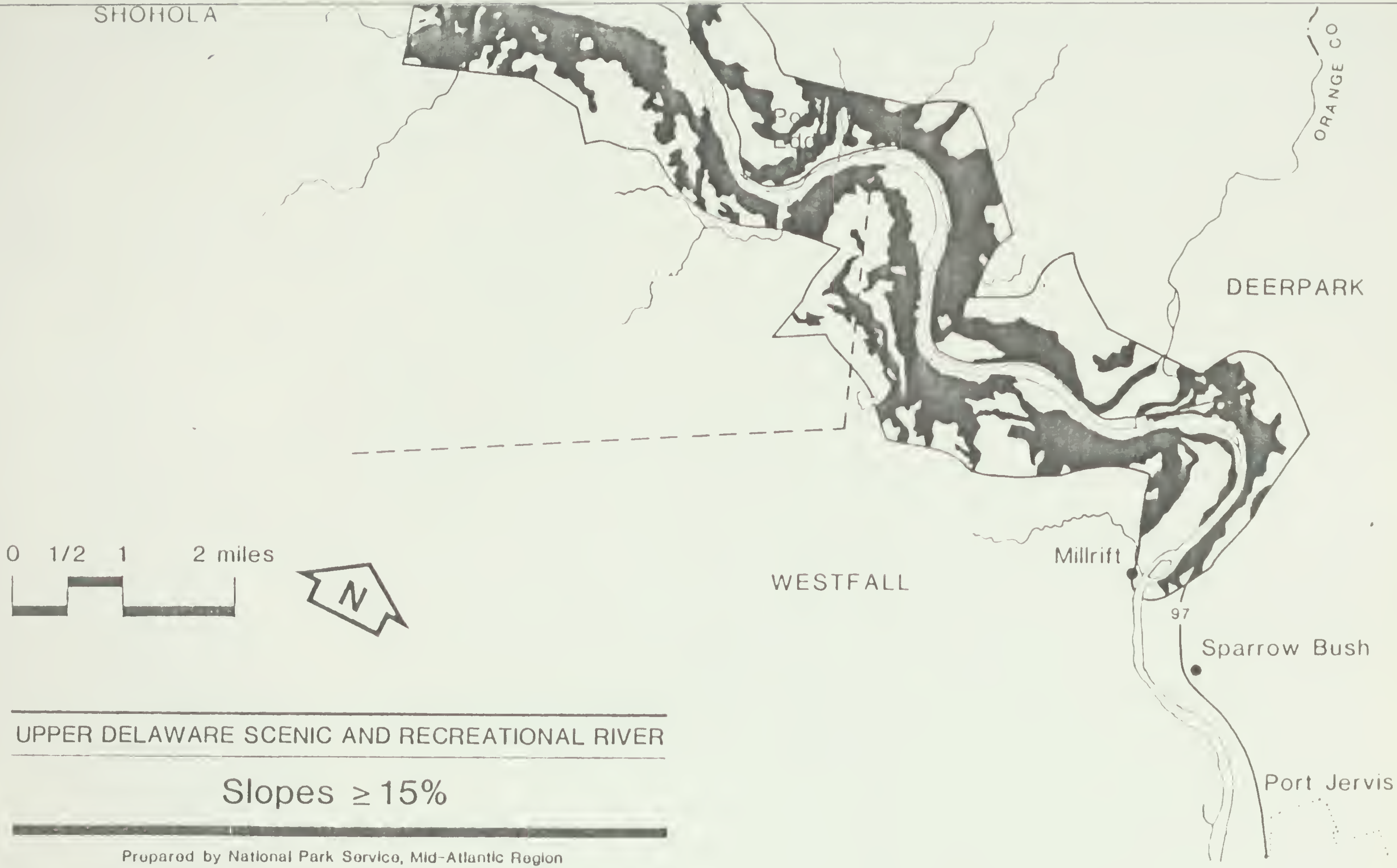
Geologic processes in the river area left many economically valuable deposits, including bluestone, sand and gravel, shale, and peat. Within the Upper Delaware river corridor reserves of sand and gravel and bluestone are found. Sand and gravel are the primary minerals mined today in the area. They are used primarily for aggregates and concrete used in construction. Some sand and gravel is sold for commercial use and some is used by federal, state and local governments for road construction and maintenance.

In New York, there are at least 6 active sand and gravel operations in proximity to Upper Delaware area. These include operations based in Yulan, Narrowsburg, Barryville, Port Jervis, Mongaup Valley and Callicoon. Information on the number of active sand and gravel operations in Pennsylvania is unavailable.

There is some bluestone, marble and shale in the area, and a few active operations for these minerals are found in New York. Sandstone is also found along the river cliffs, and isolated pockets of uranium also occur. There are no known significant deposits of metals, anthracite or bituminous coal. Isolated pockets of petroleum and natural gas may be found, but there are no known areas of high production.

SLOPES EQUAL TO OR GREATER THAN 15%

MAP 4



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Slopes ≥ 15%

Prepared by National Park Service, Mid-Atlantic Region

Soils

The parent materials for most of the soils within the river corridor were largely deposited as till or outwash from receding glaciers. Red and gray sandstone, siltstone, and shale are primary contributors to the soils. A large area of agriculturally productive soil is found on the river floodplain and alluvial flats. Flooding renews this soil and aids in maintaining its productivity.

Information about the soils in each of the five Upper Delaware counties varies widely. Only two of the counties have complete and detailed soil surveys; others have out-dated or very general information about soil capabilities. However, as shown on Map 5, it appears from the available information that the majority of the soils in the river corridor present severe limitations to the disposal of septic tank effluent (see Appendix D for sources of mapped information.) These limitations are due to any of a number of factors: steep slopes, slow permeability, a shallow depth to bedrock, excessive stoniness, or a seasonal high water table. The most suitable soils for septic systems are generally found adjacent to the river on the inside (the deposition side) of meanders in the channel. The fact that many structures with onsite septic systems have been built on seemingly unsuitable soils indicates the generalized nature of the soil survey: within an "unsuitable" area many smaller pockets of suitable soils may be found.

3. Floodplains

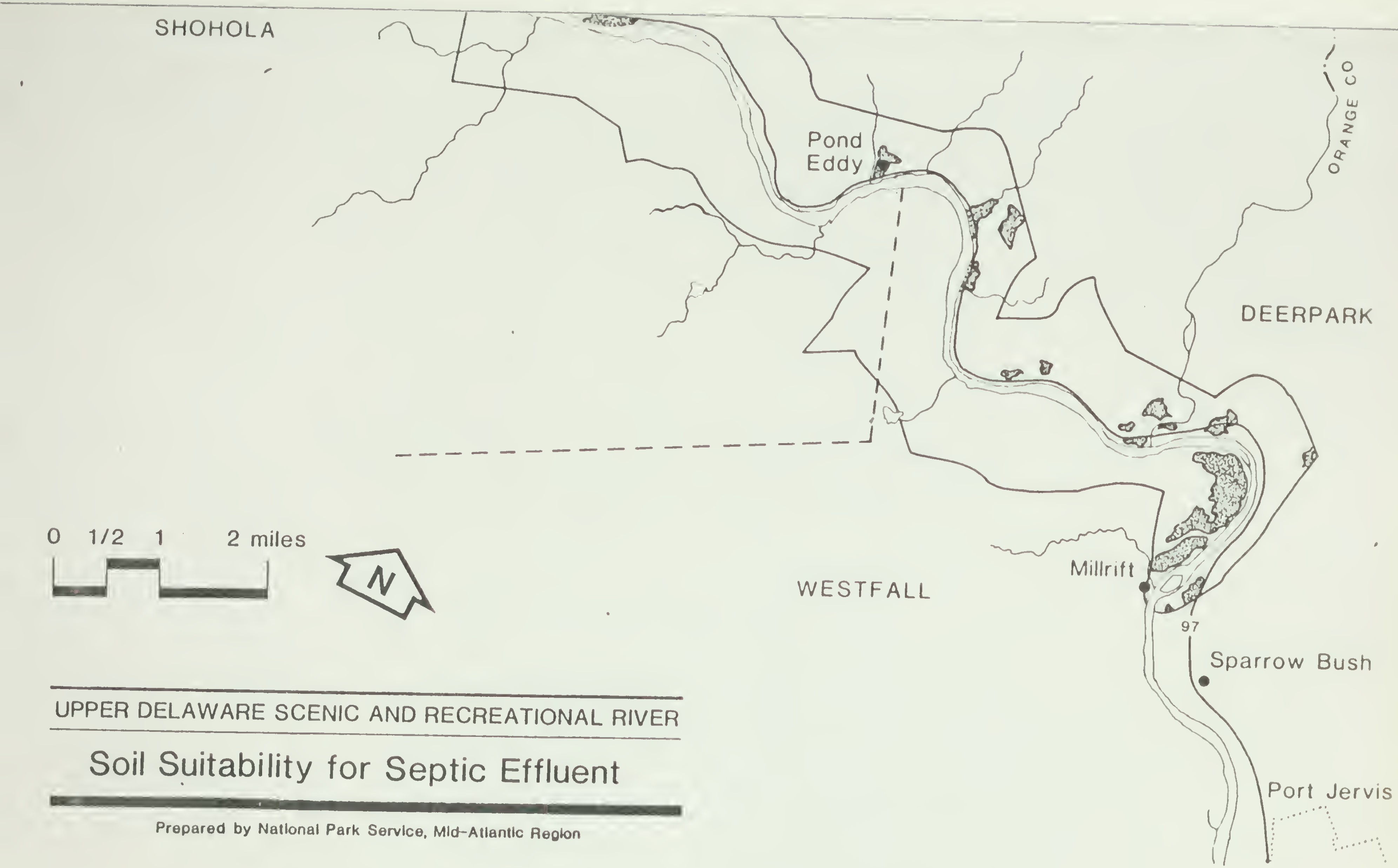
The river floodplain is the flat area adjacent to the river channel constructed by the present climate and overflowed at times of high discharge (Dunne and Leopold, 1978). Floodplains act as a natural reservoir and temporary channel for excess water. The 100-year floodplain is an area having a one in one hundred (or 1%) average frequency of flooding in any given year.

For the most part, the Upper Delaware River floodplain is a fairly consistent 1/4 to 1/2 mile width between Hancock and Skinner's Falls, narrowing between Skinner's Falls and Narrowsburg, and again at the southern portion of the river corridor (see Map 6). Characterized by lowland forest vegetation, the floodplain contains riparian vegetative associations and some instances of primary successional species. Floodplain mapping for the river corridor is currently underway by the U.S. Geological Survey and the U.S. Army Corps of Engineers, as part of the National Flood Insurance Program (see Appendix D). Eight of the fifteen Upper Delaware towns have adopted floodplain protection ordinances as part of this program; the remainder are still in the program's emergency phase. During the last fifteen years, approximately fifty new structures have been built within the floodplain corridor.

4. Wetlands

Wetlands are defined by the U.S. Fish and Wildlife Service as lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water (U.S. Department of the Interior, 1979, p. 3). Wetlands are inundated by surface or groundwater with a frequency sufficient to support vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands are important for water quality protection, aquifer recharge, natural flood mitigation and erosion control. They are also critical for wildlife habitat and breeding for fish and waterfowl.

In the Upper Delaware River corridor, wetlands generally consist of marsh areas and wooded swamps. The largest concentrations of wetlands within the river corridor are found in Fremont, NY, and Lackawaxen and Shohola, PA. The few wetland areas located on the New York side of the river corridor have been mapped by the New York Department of Environmental Conservation.



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Soil Suitability for Septic Effluent

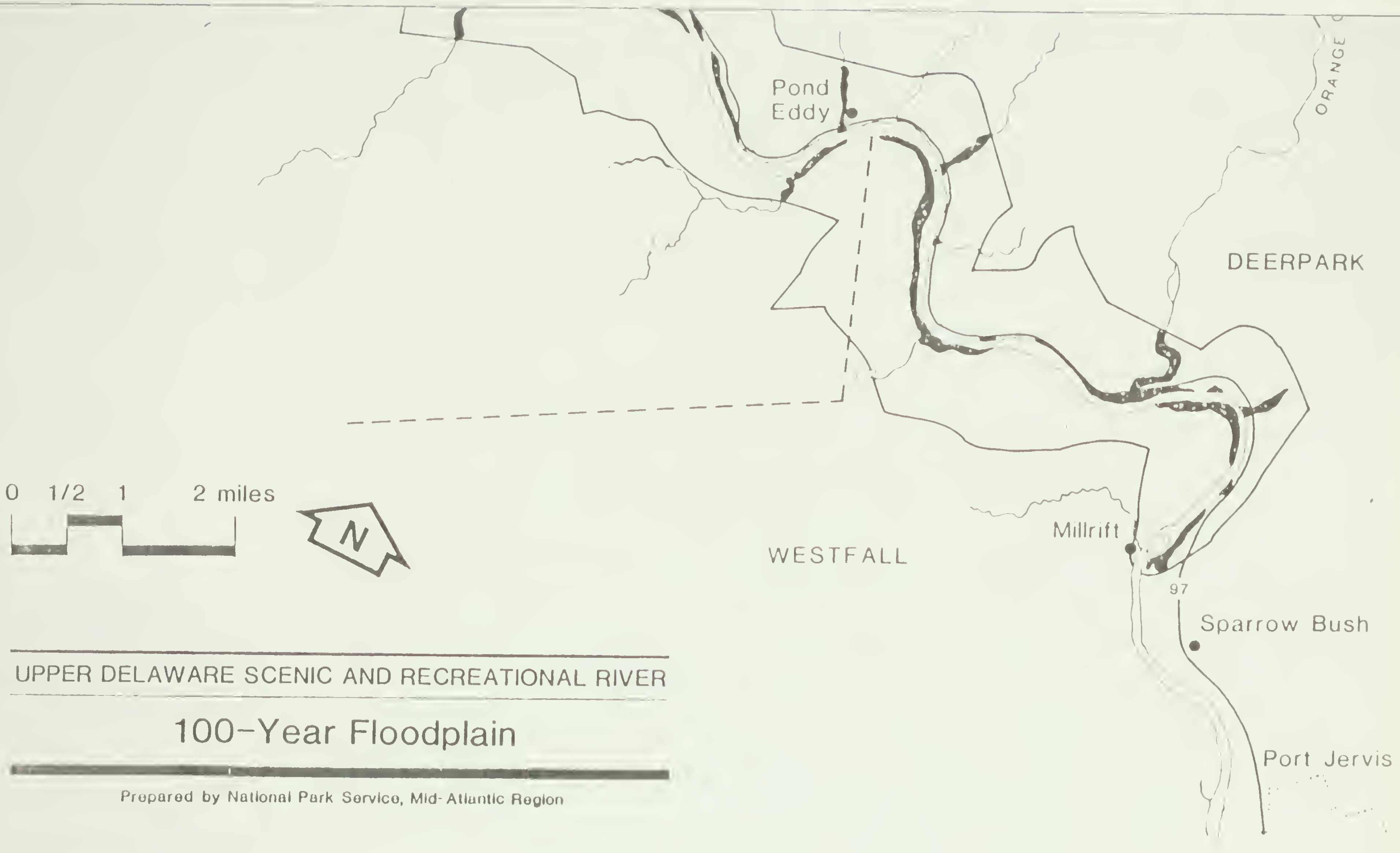
Prepared by National Park Service, Mid-Atlantic Region

SOIL SUITABILITY FOR SEPTIC EFFLUENT

MAP 5

100 YEAR FLOODPLAIN

MAP 6



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

100–Year Floodplain

Prepared by National Park Service, Mid-Atlantic Region

According to the Pennsylvania Department of Environmental Resources, the few wetlands along the Upper Delaware are primarily located on the upland plateaus, outside of the river corridor boundary. Because of the small number of wetlands in the corridor they are not shown on a map.

5. River Characteristics

The Delaware River is free-flowing from Hancock, New York to the Atlantic Ocean, a distance of 331 miles. Of the 3,422 square-mile Upper Delaware drainage area, 2,144 square miles are drained by uncontrolled or natural flows. The Upper Delaware River has five major tributary streams: the West Branch (which drains 664 square miles), the East Branch (840 square miles), the Lackawaxen River (597 square miles), the Mongaup River (208 square miles), and the Neversink River (333 square miles).

Within the river corridor, the Delaware varies between 150 and 1,500 feet in width, with most of the river between 300 and 500 feet wide. Riffle areas are generally 2 to 8 feet deep and pools 12 to 20 feet deep. The two deepest pools are at Narrowsburg (113 feet) and Pond Eddy (45 feet). There are more riffle areas than pools in the river. The pools or eddies are generally between 1/4 and 3/4 of a mile in length. The stream bottom is mainly composed of gravel and rubble, and in a few places, exposed bedrock. Although the average gradient is 6 feet per mile, there are some 2-mile stretches where the drop ranges from 13 to 30 feet per mile, creating whitewater rapids during periods of medium to high water levels. Major whitewater areas on the main stem of the Delaware include: from Basket Creek to Kellams Bridge (above Callicoon), Skinners Falls near Milanville, from below the Narrowsburg Bridge to the confluence of Ten Mile River, Westcolang to above the Lackawaxen River, Shohola Rapids, and alternating rapids, quickwater and stillwater between Pond Eddy and Cherry Island, including Mongaup Rapids.

New York City owns and operates the Cannonsville Reservoir on the West Branch and the Pepacton Reservoir on the East Branch; a third reservoir is located on the Neversink River, which flows into the Delaware near Port Jervis. A series of 5 reservoirs have been developed on the Mongaup River by Orange and Rockland Utilities for hydroelectric power generation. Lake Wallenpaupack (operated for hydropower by Pennsylvania Power and Light Company), Prompton Reservoir and General Edgar Jadwin Reservoir (both operated for flood control by the U.S. Army Corps of Engineers) regulate discharges on the Lackawaxen River.

Four gauging stations monitored by the United States Geological Survey are located at key locations in the Upper Delaware basin: Hale Eddy (West Branch Delaware), Harvard (East Branch Delaware), Callicoon (main stem Delaware) and Woodbourne (at Neversink).

6. Flow Management

Aside from natural factors such as rainfall, flows in the Upper Delaware River are influenced by three major factors. The first of these is the allocation of water from the Delaware for transport out of the river basin, as specified in a U.S. Supreme Court decree of 1954. The second, which also arises from the Supreme Court decree, is the pattern of releases from upper basin reservoirs used to meet the requirement that a minimum flow of 1,750 cubic feet per second (cfs), as measured at the gauge at Montague, New Jersey, be maintained. Finally, releases from upper basin reservoirs are made to conserve riverine fisheries.

The U.S. Supreme Court decision was the result of a suit brought by New Jersey against New York. The decree, 347 U.S. 955 (1954), gave New York City the right to withdraw 800 million gallons per day (mgd) from the Delaware, provided that the city maintain a flow of 1,750 cfs in the Delaware River at Montague, New Jersey. It further provided that New Jersey could withdraw 100 mgd from the Delaware for transfer out of the Delaware Basin. (1 mgd equals 1.54 cfs.)

In agreeing to the Delaware River Basin Compact in 1961, the four basin states (New York, New Jersey, Pennsylvania and Delaware) agreed on behalf of themselves and their political subdivisions not to go back to the Supreme Court on their own for the life of the compact (a minimum of 100 years) to apply for any modification of the terms of the decree that would increase or decrease the diversions authorized or the releases required.

Thus, the 1954 allocations can be changed by the Delaware River Basin Commission, but only with the unanimous consent of the four states and New York City during normal hydrologic conditions. During declared emergencies, a unanimous vote of the DRBC commissioners can change the decree allocations. Congress did not give (and does not have the constitutional authority) to give the National Park Service any authority to intervene in the allocation.

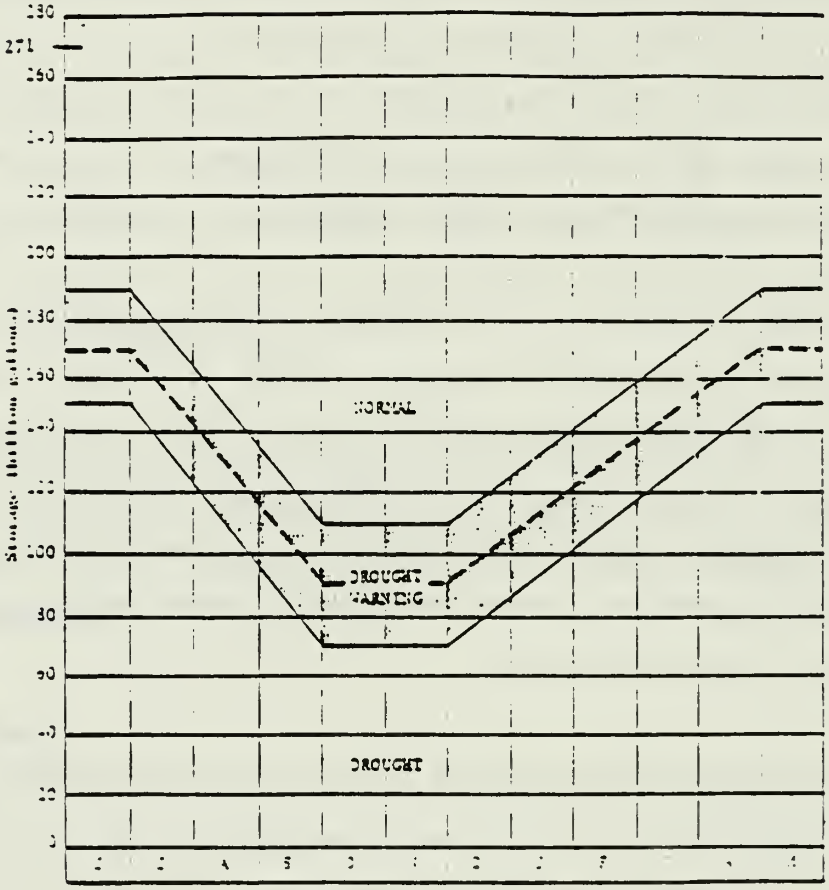
When the drought of 1980-1981 made it obvious that flows were inadequate to sustain both 800 mgd for out-of-basin use and a flow of 1,750 cfs at Montague, the Delaware River Basin Commission, with the unanimous consent of the parties to the decree, agreed upon reductions to take place during drought warnings and drought emergencies. Under these restrictions (summarized in Table III.1 divisions by New York City and New Jersey decline in proportion to the storage in New York's Delaware Basin reservoirs and salinity conditions in the Delaware salinity conditions in the Delaware estuary. Basically, New York must release enough water from its reserviours into the Delaware to keep the "salt front" downstream of the Philadelphia and Southern New Jersey water supplies.

The Supreme Court appointed a River Master to supervise the provisions of the decree. The operating procedures by which the Montague target flow is maintained (that is, how much water is released over a certain period by each of the three New York City dams) are also controlled under certain conditions by the New York Department of Environmental Conservation.

Source: Water Code, Delaware River Basin Commission, 1985

TABLE III.1

1A. OPERATION CURVES FOR CANNONSVILLE, PEPACTON AND NEVERSINK RESERVOIRS



1B. INTERSTATE OPERATION FORMULA FOR REDUCTIONS IN DIVERSIONS, RELEASES, AND FLOW OBJECTIVES DURING PERIODS OF DROUGHT

NYC storage condition	NYC Div. mgd	NJ Div. mgd	Montague flow objective cfs	Trenton flow objective cfs
Normal	800	100	1750	3000
Upper Half-Drought Warning	680	85	1655	2700
Lower Half-Drought Warning	560	70	1550	2700
Drought	520	65	1100-1650*	2500-2900*
Severe Drought (to be negotiated based on conditions)				

* Varies with time of year and location of salt front as shown on Table 2.

1C. FLOW OBJECTIVES FOR SALINITY CONTROL DURING DROUGHT PERIODS

	Flow objective, cubic feet per second at:					
	Montague, N.J.			Trenton, N.J.		
7-day average location of "Salt Front," River-mile*	Dec-Apr.	May-Aug.	Sept-Nov.	Dec-Apr.	May-Aug.	Sept-Nov.
Upstream of R.M. 92.5	1,600	1,650	1,650	2,700	2,900	2,900
Between R.M. 87.0 and R.M. 92.5	1,350	1,600	1,500	2,700	2,700	2,700
Between R.M. 82.9 and R.M. 87.0	1,350	1,600	1,500	2,500	2,500	2,500
Downstream of R.M. 82.9	1,100	1,100	1,100	2,500	2,500	2,500

* Measured in statute miles along the navigation channel from the mouth of Delaware Bay.

During normal hydrologic conditions, the Delaware River Basin Commission has authorized, in cooperation with the New York Department of Environmental Conservation, a program of augmented conservation releases, to improve recreational fishing and boating conditions of the river. The schedule of conservation releases was initiated as an experimental program in 1977 and formally adopted by DRBC in 1983.

7. Groundwater

Important groundwater resources are found in two major types of aquifers in the river corridor in consolidated bedrock and unconsolidated glacial and post-glacial deposits. The major bedrock unit in the river corridor is collectively known as the Catskill Formation of the Upper Devonian period, consisting of shales, claystones, siltstones and sandstones. Most of the bedrock is covered by unconsolidated, generally stratified glacial deposits of Pleistocene and Quaternary Age. Valley fill deposits occur in the larger valleys; measured thickness ranges from 0 to 340 feet. Valley fill deposits are the most significant aquifers in the river corridor. Reported yields from wells tapping these deposits range from 2 to 900 gallons per minute. Upland glacial, alluvial, and colluvial deposits cover much of the upland areas and smaller valleys; measured thickness ranges from 0 to 220 feet. These upland deposits generally do not comprise significant aquifers.

The groundwater resources along the river corridor are derived exclusively from the infiltration of rainfall into suitable aquifers through a process known as recharge. Within the more rugged terrain, only a small percentage of the annual precipitation is made available as groundwater. The remaining rainfall runs off as surface water or is lost through evapotranspiration or evaporation. Faults, fracture traces or fissures within the bedrock will, where present, permit greater penetration of rainfall and a corresponding increase in available groundwater.

8. **Water Quality**

Surface Water Quality

Water quality standards for the Upper Delaware River are promulgated by the Delaware River Basin Commission (DRBC) and the States of New York and Pennsylvania. Standards are developed cooperatively and therefore, are similar in nature. Existing water quality standards are managed under a non-degradation policy, with the objective of maintaining waters for a wide variety of uses. These include public and industrial water supply (after reasonable treatment), agricultural water supply, recreation, wildlife maintenance and propagation of resident game fish and other aquatic life, spawning and nursery habitat for anadromous fish, and passage of anadromous fish.

The DRBC and the National Park Service monitor the water quality of the Upper Delaware through annual summer limnological studies. The program collects biological, bacteriological and chemical data. In recent years the program's thrust has been the assessment of impacts from reservoir releases and the assessment of water quality and potential pollution sources. Routine water quality monitoring is performed by the States of New York and Pennsylvania.

According to the DRBC 1984 Water Quality Inventory Report, at most locations the data indicate water quality meets or exceeds water quality standards. Most of the Delaware River, above the Delaware Water Gap, has good to excellent water quality. The entire main stem of the Upper Delaware meets federal "fishable and swimmable" water quality goals. Macroinvertebrate data collected in 1981-1983 in the Upper Delaware indicate that stream health is excellent. Table III 2 summarizes water quality monitoring data collected during 1982 and 1983 during routine state monitoring. These data identify the range of observed values for key parameters for water quality samples collected at Hancock (just north of the river corridor boundary), Lordville, and Port Jervis (four miles south of the river corridor boundary).

The Upper Delaware River is classified as "Effluent-Limited" in accordance with the Federal Clean Water Act. Wastewater treatment plants are required to achieve secondary treatment levels. There are approximately ten minor point sources with federal permits under the National Pollution Discharge Elimination System (NPDES) discharging into the river, including municipal treatment plants, camps, schools, and small industrial facilities. Since 1981, a major accomplishment has been the completion of sewerage and treatment facilities for Hancock, New York. Prior to completion, raw sewage including hospital wastes was discharged untreated. Based on information from the U.S. Environmental Protection Agency, the New York Department of Environmental Conservation, and DRBC, there are no existing problems with pollution from federally owned or operated facilities within the river corridor.

Non-point sources of pollution are dispersed and diffuse - for example, street washoff that enters streams in urban areas during rain; herbicides, fertilizers, manure and other agricultural "pollutants"; malfunctioning septic and other on-lot systems; leachate from landfills; erosion during construction activities; and many other sources. Non-point sources are generally related to land use and precipitation. Some non-point sources such as construction-related soil erosion are regulated by state programs. The cumulative impact of these sources on the Upper Delaware is not reported to be in violation of water quality standards at this time.

In the summer of 1985, a more intensive water quality monitoring program was conducted on the Upper Delaware by the Delaware River Basin Commission and the National Park Service. Twelve locations on the main branch of the Upper Delaware and 38 tributaries were sampled.

Table III.2
Summary of Water Quality, 1982 and 1983 as observed by Routine State Monitoring Stations

Parameter		West Branch at Hancock	Lordville RM 322	Port Jervis RM 255
Dissolved Oxygen (mg/l)	Ave	9.6	9.7	9.7
	Max	10.5	11.6	12.6
	Min	8.5	7.8	7.6
	#	3	2	8
pH	Ave	6.5	6.6	7.2
	Max	7.2	7.2	7.7
	Min	5.9[1]/	6.1	6.6
	#	19	6	10
Fecal Coliform (#/100ml)	Ave[2]/	76	87	33
	Max	180	100	1400
	Min	50	75	84
	#	4	2	10
Total Phosphate (mg/l)	Ave	0.13	0.23	0.06
	Max	0.37	1.07	0.09
	Min	0.06	0.03	0.03
	#	19	6	10
Ammonia Nitrogen (mg/l)	Ave	0.02	0.003	0.02
	Max	0.09	0.02	0.04
	Min	0.01	0	0
	#	19	6	5
Nitrate & Nitrite Nitrogen (mg/l)	Ave	0.17	0.16	0.44
	Max	0.34	0.21	0.65
	Min	0.08	0.10	0.30
	#	19	6	10
Conductivity (micromino)	Ave	74	70	73
	Max	85	80	79
	Min	60	60	66
	#	19	5	10
Sampling		PA	PA	NY

1/ lab pH - Field pH normally higher
2/ geometric mean

Preliminary findings of this testing program indicate that most study area tributaries and Delaware River locations continue to have good to excellent water quality. The 1985 data collection program coincided with a period of less-than-normal precipitation and reduced flow releases from the three New York City reservoirs. The impact of these circumstances was felt on the water quality of the Upper Delaware. Water quality was visually degraded due to increased aquatic plant growth (algae, rooted plants and periphyton). The reasons for the increased plant activity are the lack of spring nutrient/sediment flushing, the slower stream velocities and the greater amount of river bed exposure to sunlight penetration. This increased plant activity is believed to be responsible for the apparent greater amounts of river foam and films observed during summer monitoring. In addition, dissolved oxygen concentrations in the river generally were at saturation or greater than saturation. Extremely high super-saturation was observed on numerous occasions, including values greater than 150%. The effect was most noticeable in the upper reaches of the Upper Delaware and was, as expected, accompanied by high pH values, which occasionally violated stream standards. Concern about possible drops in dissolved oxygen during evening hours led to night time measurements of dissolved oxygen in late August. The sampling indicated that D.O. was not decreasing to values below stream standards, but the possibility cannot be discounted at other locations and dates. In general, however, it is believed that the drought-related impacts were more visual than of serious water quality concern.

Data for most Upper Delaware tributaries indicate no water quality problems. Exceptions are Little Equinunk Creek, which appears to be impacted by streams flowing through agricultural areas, and Callicoon Creek within the hamlet of Callicoon. Both conditions are only minor problems. The latter may be responsible for the higher than normal fecal bacterial levels observed at the Callicoon Access Area on the New York side of the river.

Groundwater Quality

In general, the groundwater quality of the Upper Delaware River Basin is quite good, and well within the drinking water standards established by EPA. Table III.3 is a compilation of groundwater quality data from the Delaware River Basin Commission. To summarize this data, groundwater obtained from Pleistocene unconsolidated deposits contains considerably smaller amounts of dissolved solids than most bedrock formations. Quite often, the quality of this unit partially reflects that of the underlying bedrock. Groundwater derived from the Pleistocene deposits is generally "soft" and usually neutral to slightly acidic. The specific conductance is low, indicating the low dissolved solids content. Total dissolved solids (TDS) are approximately 100 mg/1, and levels of bicarbonate are among the lowest in the study area. Iron and manganese concentrations generally pose no significant problems, and the sulfate levels are relatively low, consistent with many of the bedrock formations.

The primary bedrock unit in the Upper Delaware, the Catskill Unit, has excellent quality water which is low in dissolved solids and hardness. Most chemical concentrations in this unit are significantly lower than those encountered in other bedrock units of the Upper Delaware basin. Specific conductance is low to moderate and, occasionally, high levels of dissolved iron are reported. The wealth of water quality information for this unit throughout the study area documents the ability of the Catskill to supply good quality water. Groundwater contamination due to man's activities is slight in this unit due to the sparse population.

Incidents of groundwater contamination in the Upper Delaware have been almost entirely minor in nature -- lower level contamination such as salt storage, and gasoline and oil spills. The unconsolidated deposits of the river corridor are susceptible to contamination due to their high permeability. Groundwater contamination is a concern at the Cortese Landfill located in the Town of Tusten, New York. The landfill is situated

Table III.3
Chemical Quality of Groundwater
The Upper Delaware River Basin

Simplified Stratigraphic Unit	Specific Conductance (umhos/cm	pH (units)	Bicarbonate (mg/l)	Nitrate-Nitrogen (mg/l)	Hardness (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Sodium (mg/l)	Potassium (mg/l)	Chloride (mg/l)	Iron (mg/l)	Manganese (mg/l)	Dissolved Solids (mg/l)
PLEISTOCENE													
Mean	210	6.8	51	1.56	66.3	19.3	4.3	5.0	0.9	7.2	0.29	0.07	119
No. of Samples	11	34	25	28	42	22	17	15	13	48	37	19	27
Mean Median	154	6.8	27	0.80	48	13.0	2.9	3.8	0.7	4.0	0.11	0.01	94
No. of Samples	11	34	25	28	42	22	17	15	13	48	37	19	27
Range	44-475	5.8-8.1	6-232	0.0-5.8	13-270	3-74	1.2-11	1.0-18	0.0-2.6	0.6-58	0.01-2.0	0.0-1.0	28-367
CATSKILL													
Mean	141	6.2	44	0.81	55	11.3	2.6	28	0.5	27	5.80	0.10	254
No. of Samples	29	76	27	78	77	27	27	25	14	97	96	84	19
Mean Median	111	6.7	31	0.61	53.2	8.2	2.4	6.3	0.6	3.2	0.2	0.03	112
No. of Samples	33	96	31	98	97	31	31	29	18	117	116	88	23
Range	34-958	6.0-8.3	8-148	0.0-6.7	15-152	2.9-28	0.9-9.6	0.1-87	0.0-1.3	0.6-800	0.01-8.4	0.0-1.3	26-1400

Source: Special Groundwater Study of the Upper Delaware River Basin - Volume I. Prepared by R.E. Wright Associates for the Delaware River Basin Commission. No date.

at the base of a cliff approximately 900 feet from the river and 1500 feet downstream from the water supply well for the town of Tusten. Over a nine month period in 1973, hazardous and toxic wastes were reported to have been dumped or buried at the site. The landfill, which was closed in July, 1981 is low on the National Priorities List for clean up under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA; also known as Superfund).

Ongoing studies of surface and groundwater quality in the area immediately surrounding the landfill have been conducted since 1980 by the New York State Department of Environmental Conservation. Research has also been conducted by Pennsylvania State University for NPS documenting qualitative changes in macrobenthic and fisheries communities which may be associated with the landfill. During the fall of 1984 and spring and summer of 1985, macroinvertebrates and fishes were collected. Preliminary testing results at this time are not conclusive, although a decrease in the total number of macroinvertebrates present in the first 2 testing stations below the landfill was noted between sampling periods of fall, 1984 and spring, 1985.

9. Vegetation

The majority of the river corridor (73%) is heavily forested with a mixture of evergreen and deciduous trees. A wide variety of vegetative communities exist within the nearly 42,000 acres of woodland. These range from the dominant oak species through sugar, maple, hemlock and mixed hardwoods to the understory species of dogwood, sassafras and hornbeam. Shrubs include viburnum and spicebush. Past human actions -- fire, timbering practices, quarrying, settlement and agriculture -- have all had a marked influence on the present vegetation of the area, favoring certain species over others.

The combination of closed-canopy forest and open agricultural landscape in the river corridor produces a varied botanical resource. Pastures, croplands, and farmsteads create the forest "edges" and open spaces that maintain a diversity of plant species. The regional vegetative succession begins with herbs that include the tall grasses, goldenrod, and ragweed, and continues with initial woody invaders such as red cedar, gray birch, aspen, and sassafras that provide good habitat diversity for the corridor's wildlife population.

Along the riverbanks and on the islands, young woodland trees, such as sycamore, silver and red maples, basswood, elm, ash, cottonwood, and a variety of willows are present. Shrubs and understory plants include alder, spicebush, sumac, button bush, and elderberry. At higher elevations mixed hardwoods, oaks, evergreens and young woodland trees are all found. The understory includes rhododendron and mountain laurel along the moist slopes of ravines. Ferns grow along the riverbanks and on rocky outcroppings. Wildflowers and herbs include purple loosestrife, day-lily, may-apple, Indian pipe, wild bergamot, monkey flower, pickerel weed, solomon's seal, rattlesnake plantain, and cardinal flower.

Because much of the lowland within the river corridor is under cultivation or in pasture, agricultural crops, pasture grass, and clover dominate the river floodplain. Small numbers of softwoods, such as pine and spruce trees, are also found in the floodplain.

Upland abandoned fields have been taken over by initial woody invaders, and pitch pine, providing browse for deer. A few scrub oak barrens appear on burned-over land with thin, poor, acid soils.

According to the U.S. Fish and Wildlife Service and two separate studies conducted by the New York Natural Heritage Program and the Morris Arboretum in Philadelphia no extant populations of federally listed endangered or threatened plant species are found within the river corridor.

The Pennsylvania study, published in August 1985, was conducted by the Morris Arboretum of the University of Pennsylvania for the National Park Service. The study identified one or more populations of six Pennsylvania special concern species in or near the Upper Delaware corridor. Of greatest significance was the discovery of two extant populations of Chamissio's miner's-lettuce (Montia Chamissio), along the northern section of the river. The river corridor is the only location in the state of Pennsylvania where this plant has been observed. Other rare species include the prostrate sand cherry (Prunus Pumila var. depressa), checkered rattlesnake plantain, (Goodyera tesselata), prickly pear cactus (Opuntia humifusa) and roseroot stonecrop (Sedum rosea). These species are considered potential candidates for state designation by the Pennsylvania Department of Environmental Resources.

The New York Study, presently being conducted by the New York Natural Heritage Program for the National Park Service, is scheduled for completion in 1987. A draft report identified one or more populations of three New York rare plant species within the river corridor, as well as several rare natural communities. The rare species located include the river birch (Betula nigra), Great St. Johns Wort (Hypericum pyramidatum), and sand cherry (Prunus pumila var. depressa).

10. Wildlife

The Upper Delaware River corridor contains diverse habitats that support abundant wildlife populations. In addition to the dense forest cover, farming practices have introduced pioneer plant species and have provided pasture grasses and crops that enhance the wildlife food supply. Of the 50 species of mammals observed in the corridor, white tailed deer are a principal wildlife resource. The river valley provides some natural deer wintering areas, which are important to the maintenance of deer populations.

The river valley also provides habitat for the river otter, once abundant throughout Pennsylvania. Beaver, raccoon, muskrat, mink, red fox, and gray fox are also found in the basin. Pike County, Pennsylvania, hosts one of the highest Eastern Black Bear populations in the state. Other mammals found throughout the corridor include cottontail rabbit, gray squirrel, varying hare, woodchuck, and the timber rattlesnake, a species listed as threatened by the State of New York. New York's Department of Environmental Conservation has identified several locations in the river corridor as being critical habitat areas for the timber rattlesnake.

The river corridor hosts large numbers of waterfowl and waterbirds in the wooded riverside habitats as part of the Atlantic Flyway. Approximately 200 species of birds have been identified within the river corridor, including the federally designated endangered bald eagle. According to wildlife biologists, the bald eagle is a common migrant along the river and the highest concentration of eagle wintering areas in New York State is found in this river corridor.

During the past 15 years, wild turkey populations have increased considerably. Extensive populations of ruffed grouse are found along the river corridor. The river and adjacent uplands provide nesting habitat for the mallard, black duck, wood duck, American merganser, several hawk and owl species, and many passerine species. Turkey vultures and ospreys are present in the upper basin area.

According to the U.S. Fish and Wildlife Service no federally listed threatened or endangered mammal species are identified in the Upper Delaware River corridor. However, there are two federally listed endangered bird species that visit the area, the bald eagle (Haliaeetus leucocephalus) and the American peregrine falcon (Falco peregrinus). There is no listed critical permanent habitat for these species within the river corridor. (USFWS, 1985)

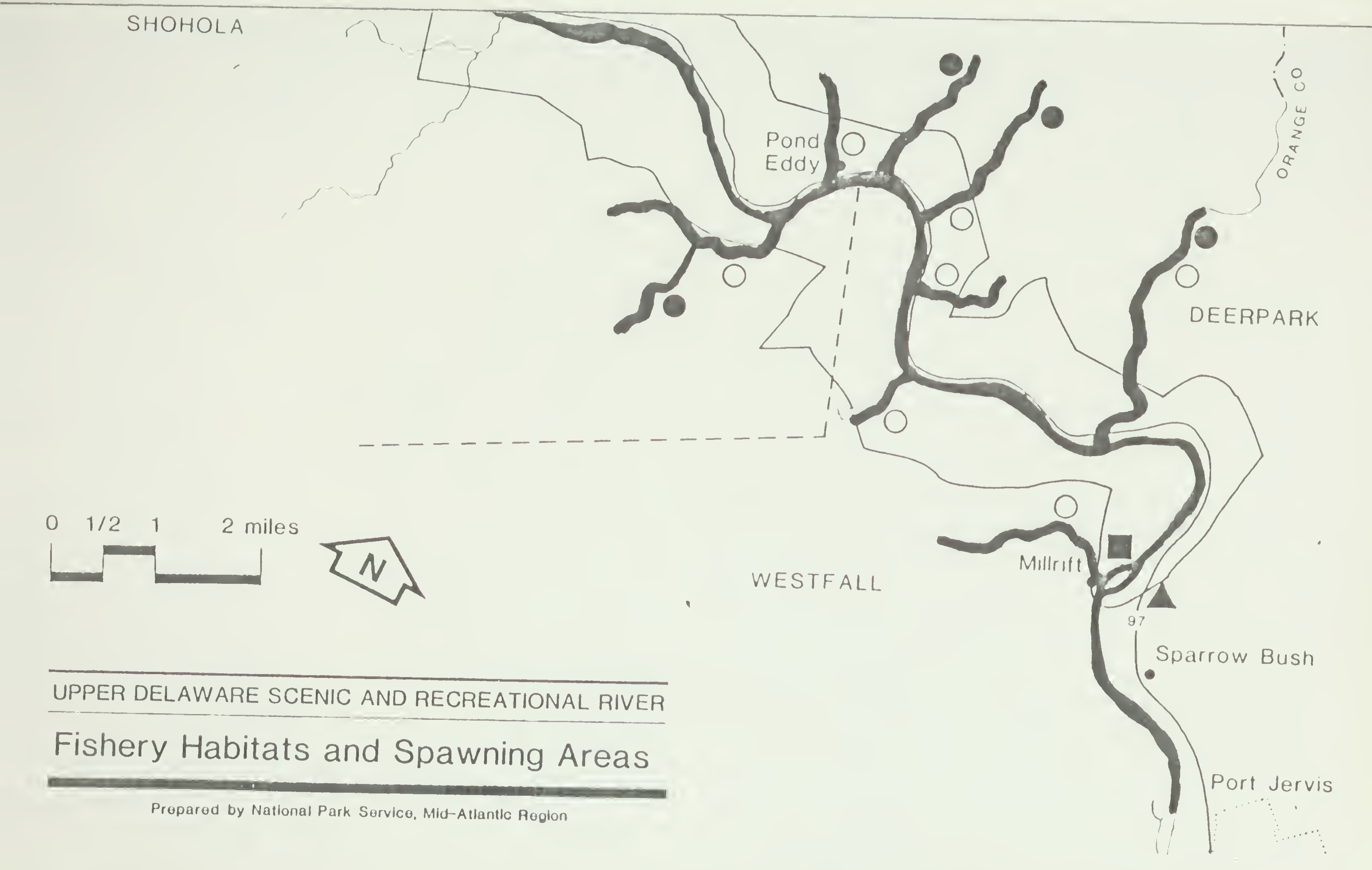
The major area of concentration in New York for the bald eagle is centered in Sullivan County, outside the river corridor. The area near the reservoirs associated with the lower Mongaup River and the Upper Delaware River supports up to 50 bald eagles between November and March each year. This area is one of the most significant bald eagle wintering areas in the northeast United States. (NY DEC, 1983) The general Hawks Nest area also provides non-nesting habitat for the bald eagle. The corridor is also used regularly during the summer months by eagles from the south, probably nesting in Florida. No bald eagle nests occur within the river corridor; the area is used exclusively for non-nesting survival activities.

The osprey (Pandian haliaetus) has been designated as being "of special emphasis" to the U.S. Fish and Wildlife Service, meaning that it is a priority species with consideration given to protection and improving habitat. It is classified as an endangered species by New York State.

The river otter is classified as being "of special importance" by the State of Pennsylvania. Approximately 70 percent of the State's otter population occurs in Pike, Wayne, and Monroe counties.

11. Fisheries

The Upper Delaware's consistently high water quality provides habitat to support diverse and well-balanced biological communities. The upper segment of the river is also unique among large rivers due to its relatively cold temperatures. Since 1967, when large volumes of cold water were first released from the Cannonsville Reservoir, the New York State Department of Conservation reclassified approximately 25 miles between Hancock and Callicoon as a cold water fishery. This stretch supports an abundant self-sustaining population of rainbow trout and brown trout, offering some of the finest trout fishing in the Northeast. The 50 miles of warmwater fishery, between Callicoon and Port Jervis, offers habitat to many species, including sunfish, bass, walleye, and fallfish and is well known for its sport fishing opportunities (see Map 7).



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Fishery Habitats and Spawning Areas

Prepared by National Park Service, Mid-Atlantic Region

FISHERY HABITATS AND SPAWNING AREAS

MAP 7

Under New York's Department of Environmental Conservation (NY-DEC) augmented reservoir releases program, the temperature in the Delaware River is usually kept low enough for the trout fisheries. (Temperatures ranging between 54°F and 66°F are defined as being optimal for growth and survival for rainbow, brook, and brown trout.) To alleviate periods of high water temperatures which might occur on certain days during the summer, even with the experimental releases, larger reservoir releases (known as "thermal stress releases") are made when necessary to minimize or eliminate thermal stress-days. A thermal stress-day is defined as a day when daily water temperatures exceed 75°F for a number of hours or the average daily mean exceeds 72°F (NY-DEC, 1983).

However, during the summer of 1985, the reservoir releases were curbed because of drought conditions in the region. A number of trout were reported killed in August, 1985 when the temperature in the river rose to a dangerous level of 72°F. According to NY-DEC's Division of Fish and Wildlife, this was the first instance of a kill in the fishery since the last drought in 1981. It is expected to take 3 to 4 years for the trout fishery to restore itself. (NY-DEC, 1985)

The Upper Delaware also provides key spawning and nursery habitat for the American shad along its entire length (see map III.5). Other major rivers in the Northeastern United States do not permit significant populations of shad to migrate upstream to spawn, due to barriers such as dams and areas of industrial pollution. The Delaware is an exception, with populations of up to 500,000 shad migrating to the upper reaches annually. The majority of spawning occurs above the Delaware Water Gap with concentrations tending to increase in an up-river direction. (Miller et al., 1982) The nursery areas are necessarily at or downstream of spawning grounds due to the downstream dispersal of young shad. The most important nursery areas are located from Belvedere to Hancock and up into the East Branch, and centered near Tusten and Lordville.

The shad spawning period runs from mid-April through June. From Port Jervis up into the East Branch the peak of the spawning period usually occurs in June, due to the slower warming waters (Miller et. al., 1982).

Temperature is one of the most important water quality parameters affecting shad. It is associated with spawning migration, spawning development and juvenile emigration. Because significant temperature changes may affect other parameters such as dissolved oxygen and the composition of the aquatic environment, an induced change in the river's temperature could be detrimental. The cold water releases from Cannonsville Reservoir have substantially reduced seasonal water temperatures below the dam in the West Branch and in the mainstem of the Delaware. This has resulted in eliminating this area as a nursery ground for shad. The greatest portion of shad runs enter non-tidal water between 51°F-54°F. Spawning begins after 54°F is reached in the upper river, and the majority of spawning occurs before the river warms to 70°F. Optimum egg development occurs at 63°F (Miller et. al., 1982).

According to fisheries biologists from New York's Department of Environmental Conservation and from the Pennsylvania Fish Commission, there are no known fisheries areas within the river corridor that are experiencing adverse impacts from soil erosion or sedimentation. An unknown amount of eutrophication is occurring in the river due to agricultural activities in the watershed, mostly from dairy farms in Wayne County (Pennsylvania Fish Commission, 1985). There are no known problems from either timbering or residential/commercial development affecting fishery habitats.

Recreation conflicts occur most often between anglers and canoeists on the river in the area from Skinner's Falls to Port Jervis. These conflicts usually take place in the spring when the shad are running up the river and the canoe season is just beginning.

The Upper Delaware is recognized by anglers and fisheries biologists as one of the finest fishing rivers in the Eastern United States. According to the 1976 New York Angler Survey, the Upper Delaware is one of the five most heavily fished river areas in the state. In 1982, it was estimated that there were nearly 12,000 annual angler-days for the river area between Hancock and Port Jervis. Since 1978, the estimated angler-days in the reach between Hancock and Callicoon have increased by 90%, while the reach between Narrowsburg and Port Jervis has experienced an increase of 205%.

American eels are found throughout the corridor, and sustain a commercial fishery during the fall, when mature eels return to the sea to spawn. Presently, there are 4 eel weirs licensed by the states of Pennsylvania and New York on the river.

According to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, there are no threatened or endangered freshwater or marine fish species in the Upper Delaware River corridor.

12. Air Quality

The river corridor area is classified by the U.S. Environmental Protection Agency as exceeding standards for photochemical oxidants and meeting standards for all other types of pollutants. The Upper Delaware region is also listed as Class II (a category which allows moderate deterioration of air quality, not to exceed the national ambient air quality standards), in accordance with the Clean Air Act of 1977. The river corridor meets all the ambient air quality standards established by the State of New York and the Commonwealth of Pennsylvania.

13. Agriculture

Agricultural land is an important resource within the river corridor. It consists largely of fertile, well-drained silt and sandy loam soils which are capable of supporting good cropland and pastureland. There are at present approximately two thousand acres under cultivation, three and a half percent of the corridor (see Map 10).

The continuation of farm operations both in and adjacent to the corridor is also a key element in the retention of the Upper Delaware's scenic rural landscape. Open pastures and croplands provide clearings in the forest canopy which reveal views of the river valley and surrounding hillsides. Aside from their aesthetic values, farmlands are important for soil conservation purposes and contribute to the diversity of vegetation and wildlife habitat.

At the federal level, prime and unique farmlands as identified by the Department of Agriculture, are to be addressed as important natural resources under the National Environmental Policy Act (NEPA). The U.S. Environmental Protection Agency has considered these prime and unique farmlands as an "environmentally sensitive resource" since 1978. The federal Farmland Protection Policy Act of 1981 (PL 97-98), calls for all federal agencies to minimize the extent to which their programs contribute to the conversion of farmland to other uses.

In New York State, the Agricultural Districts Law (Article 25 AA) identifies viable farmland resources of importance to the state, counties and public at large. Sullivan, Orange and Delaware Counties all contain agricultural districts located within and near the river corridor. Within a district, the power of local or state governments to regulate farm practices or fund community facilities (such as water or sewer lines or other utilities) is restricted. The Department of Agricultural and Markets is the lead state agency for the Agricultural Districts Program. In Pennsylvania, the Agricultural Areas Act (Act 43 of 1981) enables local governments to form agricultural areas with the consent of landowners. None have as yet been formed within the river corridor.

In both Pennsylvania and New York, the county soil conservation district offices will assist farmers in the preparation of farm conservation plans and erosion/sediment control plans in addition to recommending sound management techniques. According to district conservationists, there are few problem areas along the river due to soil erosion from cropland. Soil loss from cropland along the river would vary depending on soil types, crops and crop management practices, the slope of the land, and the amount of rainfall, but has been estimated by district conservationists in the 5 Upper Delaware counties to average 5-6 tons/acres/year. Annual soil loss from pastureland ranges from 1 to 5 tons per acre. By contrast, new residential development is estimated to cause soil loss of up to 25 tons per acre per year during construction, declining to an average of 3 tons per acre after revegetation.

D. Recreational Opportunities

1. Introduction

The Upper Delaware Scenic and Recreational River is located in a region with abundant recreation opportunities. Within a day's drive of the river are a number of federally owned recreational sites, including national forests, wildlife refuges, and recreation areas. The closest is the Delaware Water Gap National Recreation Area, managed by the National Park Service and located 8 miles downstream from the Upper Delaware. The waters of the Upper Delaware are used for swimming, canoeing, kayaking, tubing, rafting, and fishing. Public and commercial access points for these activities are located along both sides of the river. Canoeing and fishing are the most popular water-based activities and are the focus of management activities and planning.

Hunting, hiking, backpacking, camping, picnicking, sightseeing, driving for pleasure, cross-country skiing, nature photography and wildlife observation are among the land-based recreational activities enjoyed by residents and visitors to the Upper Delaware Scenic and Recreational River.

The following sections describe the recreation resources and facilities of the Upper Delaware, river use conflicts and projections for future visitor use.

2. Recreational Resources and Facilities

Visitor Orientation

New York Route 97 provides the principal access to the Upper Delaware Recreational and Scenic River, and is a direct and convenient route to locations along the river corridor. Other access routes to the Upper Delaware include U.S. 6, 206, and 209, I-84, NJ 23 and NY 17. PA 191 parallels the northern segment of the river corridor from Hancock to Equinunk. From Damascus to Narrowsburg, Pennsylvania Legislative Route 63027 runs along the river and provides an alternative access route. Township and private roads link developed areas along the river. All of the roads within the corridor show a seasonal fluctuation in traffic volumes.

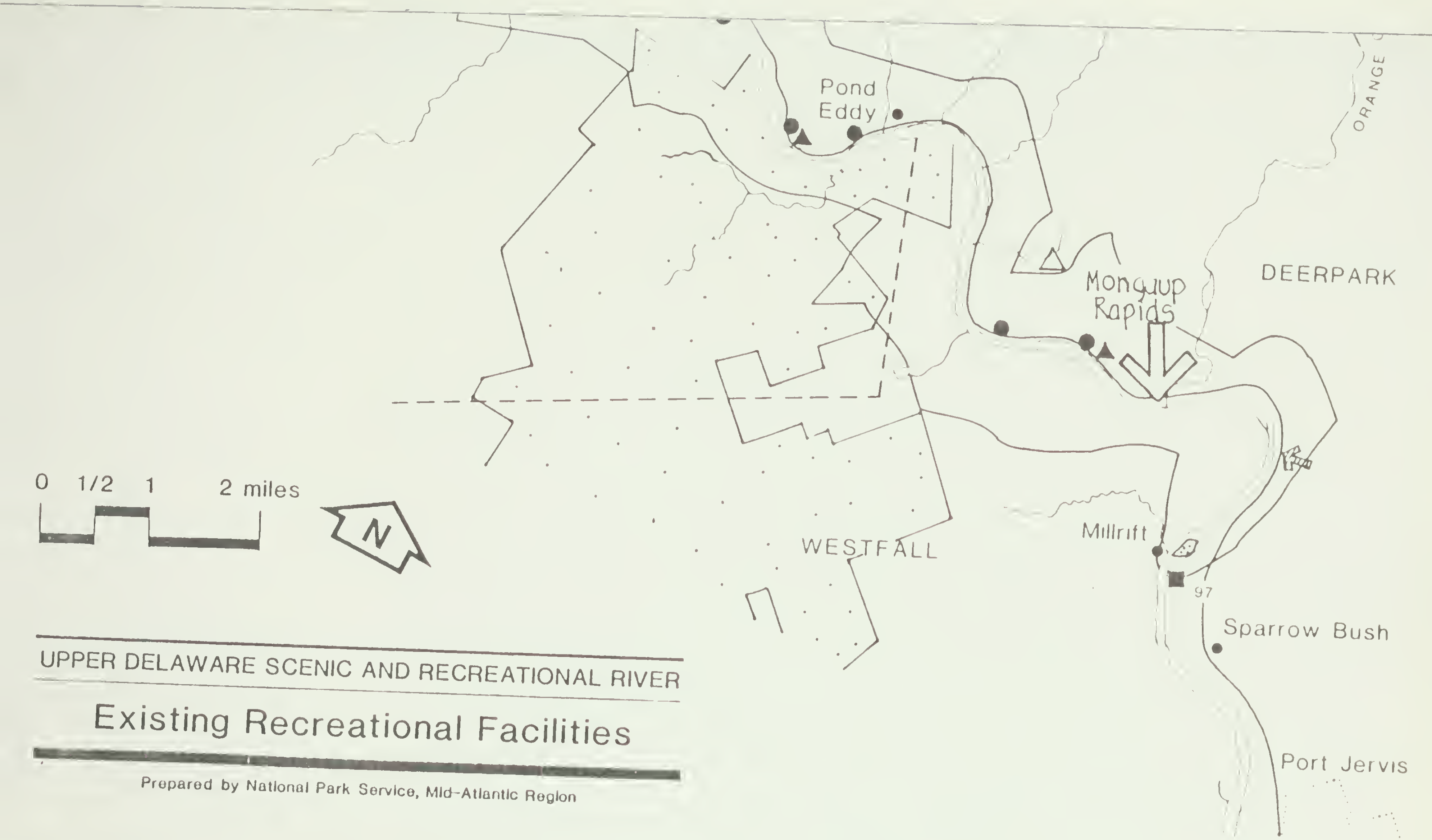
Traffic can cross the river at seven locations in the corridor, as shown on Map 8. In addition, pedestrian access is currently provided at the Roebling Bridge (Delaware Aqueduct), between Highland, NY and Lackawaxen, PA. This bridge is being restored and will be reopened as a single lane bridge. The Lordville Bridge between Lordville, NY and Equinunk, PA is presently closed to automobile traffic.

Public and Quasi-Public Facilities

The National Park Service's administrative headquarters is located on a two-acre site in Damascus Township, PA, while additional staff are housed

EXISTING RECREATION FACILITIES

MAP 8



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Existing Recreational Facilities

Prepared by National Park Service, Mid-Atlantic Region

in the Zane Grey House in Lackawaxen, PA, under a lease agreement with the owner. In addition, NPS operates two ranger stations: the north district station in Cochecton, NY and the south district ranger station in Shohola, PA.

At present there are twenty-five public and quasi-public (leased or managed by a government agency) facilities in the river corridor, ranging from river access sites to state gamelands and preserves. These sites are listed in Table III.4 and discussed in the following sections.

Visitor Contact Facilities

Visitor contact facilities provide visitors with information relating to the Upper Delaware's history, natural resources and recreational opportunities, and direct visitors to public use areas. A visitor contact facility and bookstore is located at the Arlington Hotel in Narrowsburg, NY, and is operated under a lease agreement between the National Park Service and the owner.

Interpretive programs focus on a variety of interrelated subjects such as cultural heritage, natural history, recreational use and environmental education. National Park Service interpretors are stationed along the river at kiosks to inform visitors of river conditions and safety considerations. Five kiosks are operated by the NPS at sites leased from private owners and the states of Pennsylvania and New York, in Damascus, Skinner's Falls, Narrowsburg, Ten Mile River, Lackawaxen, and the Roebling Bridge.

Current NPS staffing levels at the Upper Delaware Scenic and Recreational River include 17 permanent and 29 seasonal personnel. Staff responsibilities include law enforcement and interpretation on the river as well as all related functions necessary to maintain the NPS operation. During peak season weekends the staff patrols the length of the river by boat five times per day.

Table III.-4 Public and Quasi - Public Facilities

Location	Type of Use	Emergency Access[1]	Owner/ NPS Use Agreement	General Condition	Level of Use	Support Facilities					
						Trash	Phones	Rest-Rooms	Picnic Table	Park-ing	Other
Buckingham Township	river access	X	Buckingham Township	fair	occasional	X[2]				X	
Buckingham Township	river access	X	PA Fish Commission/NPS	good	frequent	X[2]	X	X[2]		X	
Hancock-Long Eddy	NYS Forest preserve		NY State			X				X	
Delaware-Callicoon	river access	X	NYDEC/NPS permit	fair	frequent	X[2]		X[2]		X	
Delaware-Callicoon	river access	X	PA Fish Commission/NPS	poor	frequent	X[2]				X	
Cochecton	North District Ranger Station		Private individual/ NPS lease	fair	occasional						limited public use
Damascus	river access, NPS kiosk	X	PA Fish Commission/NPS	fair	frequent	X[2]	X	X		X	

Footnotes

1. Recreational sites are open to the general public. Emergency access sites support river management operations and are not open to the general public.

2. Trash cans and restrooms provided on a seasonal basis.

3. Use of this location for river access is by individual agreement with Greater NYC Boy Scout Council. Not open to the general public.

Public and Quasi - Public Facilities, Continued

Location	Type of Use	Emergency Access[1]	Owner/ NPS Use Agreement	General Condition	Level of Use	Support Facilities					
						Trash	Phones	Rest Rooms	Picnic Table	Parking	Other
Cochecton-Skinners Falls	river access, NPS kiosk		NYDEC/NPS co-management agreement	good	frequent	X[2]	X	X[2]		X	
Damascus	NPS Headquarters		NPS	good	occasional						limite public use
Tusten-Narrowsburg	river access, NPS kiosk	X	NYDEC/NPS co-management agreement	good	frequent	X[2]		X[2]		X	
Tusten-Narrowsburg	Fort Delaware		Sullivan County	good	frequent	X		X	X	X	
Tusten-Narrowsburg	Information Center		Arlington Hotel /NPS lease	good	frequent	X		X			
Tusten-Ten Mile River[3]	river access		Greater NYC Boy Scout Council/NPS	poor	frequent	X[2]		X[2]		X	
Damascus-Darbytown	river access	X	PA Fish Commission/NPS	fair	frequent	X[2]				X	
Lackawaxen	river access NPS kiosk		PA Fish Commission/NPS	good	frequent	X[2]	X	X		X	
Highland/ Lackawaxen	Roebling Bridge, NPS kiosk	X	NPS	undergoing restoration	frequent	X[2]		X[2]			

Public and Quasi - Public Facilities, Continued

Location	Type of Use	Emergency Access	Owner/ NPS Use Agreement	General Condition	Level of Use	Support Facilities					
						Trash	Phones	Rest Rooms	Picnic Table	Parking	Other
Lackawaxen	Minisink Battlegrounds		Sullivan County Parks, NY	good	frequent	X	X	X	X	X	
Lackawaxen	PA State Gamelands, (#116)		PA Game Commission	good	frequent						
Lumberland	Roadside rest/ picnic area		NY Department of Transportation	fair	frequent	X			X	X	
Shohola	PA State Gamelands, (#116)		PA Game Commission	good	frequent						trails
Shohola	PA State Gamelands, (#209)		PA Game Commission	good	frequent					X	trails
Shohola	South District Ranger Station		Private individual/ NPS lease	fair	occasional						limited public use
Westfall	PA State Gamelands, #209		PA Game Commission	good	frequent					X	trails
Westfall	State Forest		PA Department of Forestry	good	frequent						
Deerpark-Hawk's Nest	Scenic overlook		NY Department of Transportation	fair	frequent						pull-offs

Recreation Lands

There is a small amount of state, county, and locally owned recreation land within the river corridor as shown on Map 8. New York's Department of Environmental Conservation owns an undeveloped forest preserve a few miles north of Long Eddy, NY, that is available for public use. During hunting season certain privately owned land is available for public use through agreements with the Department of Environmental Conservation. The New York Department of Transportation maintains two sites: a roadside picnic facility in Lumberland and the famous "Hawks Nest" scenic overlook in Deerpark.

The Pennsylvania Game Commission manages two areas, State Game Lands 116 and 209, in the townships of Lackawaxen, Shohola, and Westfall, primarily for forest game species. A forest preserve in Westfall is managed by the Department of Environmental Resources.

County lands in the corridor include the Fort Delaware and Minisink Battle ground Parks, owned by Sullivan County. Each of these sites have hiking and picnicking facilities. The town of Equinunk owns a primitive river access site that is used primarily by local residents.

River Access

River access sites allow recreationists to get in and out of the river at various locations. Most access sites are used for both boating and fishing. Since there are no formally designated swimming sites on the Upper Delaware, access points are often used informally for swimming.

Public river access sites are located on publicly owned lands and allow access to the river at no cost to users. Eight such public access sites in the river corridor were available in 1985. In addition two sites are located just beyond the northern and southern boundaries of the river corridor.

Commercial river access sites are owned or leased by commercial liveries as part of their business operations. Canoe, raft, kayak, and inner-tube liveries operate on the Upper Delaware. A total of 28 commercial river access are located in the corridor. The liveries use public access points as well.

Emergency sites provide law enforcement and emergency personnel with access to problem situations on the river. There are 11 such access sites on the Upper Delaware. Many of these are available only to NPS by agreement with private landowners. Public access sites also serve as emergency access points.

Canoeing

The Upper Delaware is used for all kinds of boating, however, the most popular activity by far is canoeing. The Upper Delaware is canoeable throughout its entire length, and boasts a total elevation differential of 460 feet, better than six feet per mile, although it is much steeper in some reaches. Class II white water rapids occur in 7 locations. Boating experts have stated that the combination of proximity to major metropolitan areas, high visual quality, and consistent flows due to upstream dam releases make the Upper Delaware one of the finest recreational canoeing rivers in the Northeast.

Ninety percent of the craft on the river are canoes, and of those, 90% are commercial rentals. In the summer of 1985 there were 16 canoe livery businesses operating at 28 locations within the river corridor, up from 13 businesses and 24 sites in the summer of 1980. The typical livery business opens in April and closes in October. Altogether there were approximately 8000 craft available for rent during the summer of 1985.

Data on river use throughout the United States is incomplete, but many boating experts agree that the Upper Delaware receives more recreational canoeing use than any other river in the Northeast, and that it is certainly one of the most popular canoeing rivers in the country. The New York State Department of Environmental Conservation estimated that for the period from 1978 to 1982, the annual number of boating trips on the Upper Delaware ranged between a low of 20,500 trips in 1979, and a high of over 59,000 trips in 1980. In 1982, the economic value of recreational boating activities on the river was estimated to be $12.7 million.

Camping

There were 26 commercial campgrounds within the Upper Delaware River corridor in 1985. Most of these are associated with canoe livery businesses, with the result that 60% of canoeists camp on the river before or after their canoe trip. Campgrounds offer a variety of facilities; recreational vehicle sites with electrical and water hookups are common. The capacity of campgrounds ranges from 4 sites to 300 sites, with the average being 92 campsites per campground.

There are no formally designated publicly-owned canoe-in campgrounds within the corridor. Informal camping takes place along trails on state recreation lands in New York and Pennsylvania, and on private lands by permission. Camping takes place without permission as well, causing conflicts between river users and landowners.

Fishing

The Upper Delaware is recognized by sportsmen and fisheries biologists as one of the finest fishing rivers in the Eastern United States. It offers opportunities for both cold and warmwater fishing and provides a high quality fishing experience in close proximity to major metropolitan areas. According to the 1976 New York Angler Survey, the Upper Delaware is one of the five most heavily fished river areas in the state. In 1982 it was estimated that there were nearly 12,000 annual angler days for the river area between Hancock and Port Jervis. Since 1978, the estimated fishing days in the 27 mile reach between Hancock and Callicoon have increased by 90%, while the 36 mile reach between Narrowsburg and Port Jervis experienced an increase of 205%. The annual economic value of recreational fishing to the Upper Delaware area has been estimated at nearly $5,000,000.

Management of the corridor's recreational fisheries is the joint responsibility of New York and Pennsylvania, which regulate fishing seasons and the size and creel limits for game fishes. The inter-state cooperation has resulted in common sportfishing regulations for both states. Each state requires a sportfishing license for anglers, and each state recognizes the other's fishing licenses for anglers in the river, in boats and on the riverbanks.

Hunting

The Upper Delaware Valley offers some of the best hunting opportunities in Pennsylvania and New York. Wildlife biologists recognize the river valley as an excellent hunting area because of its combination of diverse habitats, which produce abundant wildlife populations. Large tracts owned by hunting clubs contribute to these healthy populations. New York's Delaware County had the second highest deer harvest in the state in 1983, and the highest turkey harvest in the spring of 1984. Hunting also contributes substantially to the economy of the area.

Both hunting and trapping are allowed on both sides of the river on state lands and on many tracts of private lands with the owners' permission, and in accordance with existing state and federal laws and regulations. New York's Department of Environmental Conservation has developed a cooperative arrangement with the Orange and Rockland Utility Company and the Ten Mile River Boy Scout Camp to use five areas (23,640 acres) for public hunting.

Much of this area lies within the towns along the river, but only a small portion is actually within the Upper Delaware river corridor. The Pennsylvania Game Commission manages some 10,000 acres of state game lands in three corridor townships for annual harvests of game species, principally black bear, deer, turkey, grouse, woodcock, waterfowl, squirrels and rabbits.

3. Recreation Use Issues

The Upper Delaware supports numerous recreational activities, and is located close to highly populated areas. During peak visitation periods there are many different types of users on the river at the same time. Since the Upper Delaware is well known for both its fishing and boating opportunities, and because both types of uses occur in the same waters, conflicts can and do occur. Anglers are disturbed by the large numbers of canoeists, the noise they create and their interference with fishing activity by canoeing too close. Boaters see anglers, and tubers and swimmers as well, as navigational obstacles, especially in white water areas.

The stretch of river from Callicoon, NY, to the southern river corridor boundary experiences the most river use conflicts, because the greatest number of canoes are put in and taken out there. In 1979, use levels were estimated at 1 to 5 watercraft per mile above Callicoon and 15 to 35 watercraft per mile below Callicoon (Dawson et al., 1981).

The conflicts between boaters and anglers are dealt with in a variety of ways. The National Park Service attempts to educate users about appropriate behavior through information programs and enforces user regulations through staff patrols on the river. The canoe liveries station watchers at congested acres and conduct their own river patrols.

A significant degree of conflict exists between riparian landowners and river recreationists. A majority of landowners along the river have posted their land but must still contend with problems such as trespassing, invasion of privacy, vandalism, littering, and destruction of vegetation caused by boaters coming to shore, and in some cases, pedestrians (hikers) getting to the river.

According to users surveys conducted in 1984 (Conference of Upper Delaware Townships, 1984), river users complained of an inadequate number of facilities, particularly restrooms, in the corridor. This leads to trespassing on private property and problems between river users and landowners.

4. Visitor Use Projections

The New York State Department of Environment Conservation performed a ten year study of visitation on the Upper Delaware. From 1972 through 1982 the DEC conducted an annual aerial census consisting of an overflight of the river by single engine aircraft on two weekdays and two weekend days each month from April to October. Counts were made of shoreline and boat anglers and of recreational boats. Estimations of visitor use were then made for weekly, monthly, and annual visitation. The total visitation figures in Table III.5 reflect the number of recreational boats observed and recorded (multiplied by 2 for an estimation of the number of boaters) and the number of angler days (one day spent by one person fishing).

The visitor use estimations depicted in the table fluctuate over the 10 year period and do not reflect annual increases experienced at similar areas. The fluctuations in recorded river-related visitation can in part be attributed to national economic conditions such as rising gasoline prices and fuel shortages, and to regional weather and water flow conditions. The DEC figures account for river users only, as opposed to

Table III.5

NY-DEC: Estimated Visitation at the Upper Delaware River (1972-1982)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Boaters	38,418	69,670	67,638	56,596	72,578	54,940	81,210	40,520	116,674	73,672	95,794
Angler Days	7,840	10,620	11,402	10,380	7,763	9,410	4,753	4,135	5,766	9,304	11,801
Total Visitation	46,258	80,290	79,040	66,976	80,341	64,350	85,963	44,655	122,440	82,976	107,595

[1] 1979 estimates do not include the months of August through October due to aircraft malfunction.
Sources: "New York Reservoir Releases Monitoring and Evaluation Program on the Delaware River", NY Department of Environmental Conservation Technical Report 83-5, September 1983.

Table III.6

NPS: Estimated and Projected Visitation at the Upper Delaware River

	Estimates					Projections			
	1981	1982	1983	1984	1985	1990	1995	2000	2005
April Through September	83,000	88,000	147,000	109,000		N/A	N/A	N/A	N/A
Estimate off peak (Jan-March/ Oct/Dec)	73,000	18,000	78,959	N/A					
Total Visitation (Estimates)	156,400	106,500	223,100	159,900		200,200	221,000	250,000	282,900
Actual Visitation	151,218	107,288	225,959	162,490	157,711				

Source of estimates: NPS Statistical Office, Denver Service Center land-based visitors, and are substantially lower than visitation figures provided by the National Park Service statistical office, which estimates total visitation (Table III.6).

The earliest visitor use projections for the Upper Delaware were based on population growth, trends in leisure time activities, and the proximity of the area to major population centers. NPS experience at the Delaware Water Gap, which experienced steady growth in the 1970's, also influenced the projections. However, actual figures from the Upper Delaware show fluctuations, rather than a steady trend toward growth.

National Park Service visitation statistics are available for the years 1981 through 1984 (see Table III.6). Visitation peaked in 1983 when 225,959 visitors were recorded, but declined in 1984 and 1985.

Starting with a base of 151,218 visitors in 1980, visitor use is expected to grow at the Upper Delaware, but at a very moderate overall annual rate of 2.5%. This rate would result in 282,900 annual visitors by the year 2005, or a total increase over 20 years of approximately 64% (see Appendix C for visitation projections).

E. Historic and Archeological Resources

1. History

The Upper Delaware valley is believed to have been inhabited for at least 10,000 years. The patterns of settlement in both prehistoric and historic times have largely been shaped by the natural environment. The exploitation of natural resources by successive waves of settlers has in turn marked this environment.

When the first European settlers entered the Upper Delaware River area, it was inhabited by a group of Lenape or Delaware Indians who called themselves the Minsi. Historians differ in defining the territory of the Minsi, but it is generally thought they controlled the lands downstream from the mouth of the Lackawaxen River and the Iroquois lived in upstream areas. There was hostility between the Lenape (parent nation of the Minsi) and the Iroquois.

Dutch traders from Fort Nassau (Albany, New York) and Swedish settlers may have entered the valley in the early 17th century. Other European settlers may have moved upstream from the Minisink (Port Jervis) area as early as 1730. More substantial settlement began with the Connecticut Yankees known as the Delaware Company, who arrived in the 1750's, basing their land claim on the contention that Connecticut had been granted lands west of the Delaware in the 17th century. (These lands were also claimed by William Penn, as well as the Indian nations.) Land claim problems also existed on the east side of the river, where New York and New Jersey claimed overlapping segments; these disputes were only resolved by litigation after the American Revolution.

The first substantial settlement of the Delaware Company in the 1750's was at Cushetunk (Cochecton), where Company frontiersmen and settlers from New York and New Jersey built log cabins, saw mills and grist mills, and began rafting logs downstream to Philadelphia. Many settlers apparently tried to remain neutral at the beginning of the Revolution, but the majority eventually allied themselves with the Patriot (Whig) side.

Several years after the war began, serious problems arose with Indian raiders, as the Iroquois, traditional enemies of the Lenape, were persuaded to join forces with the British to terrorize settlers on the frontier. As a result of the raids, most settlers fled the upper valley. One of the bloodiest battles of the Revolution, in 1779, took place near Minisink

Ford, pitting militiamen and local volunteers against a party of Tory and Indian raiders, who won a decisive victory.

After the Revolution, repopulation and rebuilding of the valley settlements occurred slowly, stalled by confusing and inactive land claims. A few communities appeared along major transportion routes. The 18th and 19th century settlers were Connecticut Yankees and a few Dutch. Irish laborers were brought in to build canals and railroads, and the 1860's brought an influx of German immigrants, along with smaller numbers of Finns and Ukrainians, drawn by advertisements of farmland for sale.

The new transportation systems of the late 18th and 19th centuries--turnpikes, canals and railroads--largely determined the patterns of settlement in the valley. The Newburgh-Cochecton Turnpike was completed in 1811; beginning on the Hudson, crossing the Delaware, and ending at the Susquehanna, it provided a key trade and immigration route to the west, and established Cochecton as the major community of the Upper Delaware valley.

The canal era in the valley began with the completion of the 108-mile Delaware and Hudson Canal in 1828, linking Honesdale, Pennsylvania, and Kingston, New York. The canal carried anthracite from the coal fields of Pennsylvania's Moosic Mountains to New York, and followed the Delaware from Lackawaxen to Port Jervis. During the 1850's the canal transported as much as a million tons of cargo a year. However, by the 1890's increased competition from the railroad brought about its decline. The valley's first railroad line, the New York and Erie Railroad, opened in 1851. The railroad connected the Hudson River to the Great Lakes, with 12 stations along the 73 miles of its Delaware division. Unlike the canal, the railroad could operate year-round. It brought about the increased export of lumber, stone and agricultural products from the valley, while formerly scarce commodities, as well as tourists and commercial travelers, flowed in.

A number of extractive industries played key roles in the economic development of the valley. Timber rafting was a focal point of the valley economy as early as the 1760's, and continued to play an important role until suitable forests were exhausted at the beginning of the 20th century. Tanneries were major industries from the 1850's through the 1880's, until the hemlock groves, the bark of which supplied tannin, were depleted. Around this time, quarrying of bluestone and other building materials emerged as an important industry. John Fletcher Kilgour, the "Bluestone King," controlled much of the valley's industry, at one time owning 150 quarries and employing over 500 workers. Long Eddy, Kilgour Spur, Pond Eddy and Parker's Glen became the valley's major quarrying centers, from which bluestone was shipped to New York City, Jersey City, and elsewhere, as paving blocks, curbs, and decorative stonework. Quarrying remained important until the 1920's and 30's, when cement and southern granite largely replaced bluestone as a building material.

Another extractive industry, the so-called acid factories, flourished from about 1880 until 1920. Hardwoods like cherry and ash, which could not be floated downriver, were used to produce charcoal, wood alcohol, and acetate of lime. The acid factories, which employed substantial work forces at Milanville and Long Eddy, declined as hardwood stands were depleted, and as petroleum-based synthetics were developed.

Tourism, which began with the opening of the railroad, was the most enduring of the 19th century industries. Entrepreneurs soon realized the valley's potential as a summer retreat for New Yorkers, and began building hotels in the villages, while farmers took in boarders, a custom which had developed into an important industry by the 1870's.

Boardinghouses and hotels throughout the region lost much of their popularity during the depression of the 1930s, although some visitors continued to come to the area to hunt, fish, canoe, and enjoy the scenery. By the 1970s, canoeing and camping had both developed into sizable commercial operations. Canoe liveries and campgrounds appeared along the river, drawing increasingly heavy river usage in the spring and summer.

2. Important Sites

The historical remoteness of the Upper Delaware area from urban centers as well as the economic decline it experienced in this century, has helped to preserve many of its historic buildings, sites and structures. Many surveys of individual towns and counties have been completed, but the Cultural Resource Survey (April 1983) prepared by the State University of New York at Binghamton for the National Park Service, was the first attempt to systematically document and evaluate the archeological and historic resources of the entire Upper Delaware area.

Archeological Sites

The survey team identified archeological sites through a partial field survey, a literature review, an inventory of private collections, and interviews with local informants, to arrive at an inventory of 437 archeological "loci" (including sites where artifacts had been found or observed in the past by local informants). Of this number, 358 are "open sites," characterized by the presence of scattered artifacts or debris found on the surface of cultivated fields or eroded areas. These sites tend to be found in three areas: 1) alluvial fan deposits at the confluences of tributaries and the river; 2) alluvial fan deposits where the valley side slopes meet the floodplain; and 3) floodplain terraces along the river, especially in the vicinity of alluvial fans.

Thirty-one of the sites were rock shelters -- slight overhangs of rock ledges that were often used as temporary shelters or habitations. These sites generally contain more artifacts, in a better state of preservation, than do the open sites.

The area between Hankins and Narrowsburg (river miles 20 to 40) yielded about half of the total number of sites. This can be attributed to the preponderance of relatively level floodplain terraces in this part of the valley, the present-day cultivation of which has turned up large numbers of artifacts.

The Cultural Resource Survey found that 17 of the 437 sites had some potential significance, and recommended that they be evaluated for nomination to the National Register of Historic Places. One site, the Dunn site near Hancock, has already been determined eligible for inclusion in the National Register, as have two sites not mentioned in the survey, the Van Schoick and Stirna sites in Narrowsburg, which were determined eligible in 1982.

The rock shelter at Ten Mile River in Tusten was completely excavated by the New York State Museum and Science Service in 1969-1970. This site and adjacent lands (approximately 45 acres) are proposed for acquisition and interpretation by NPS in the proposed River Management Plan.

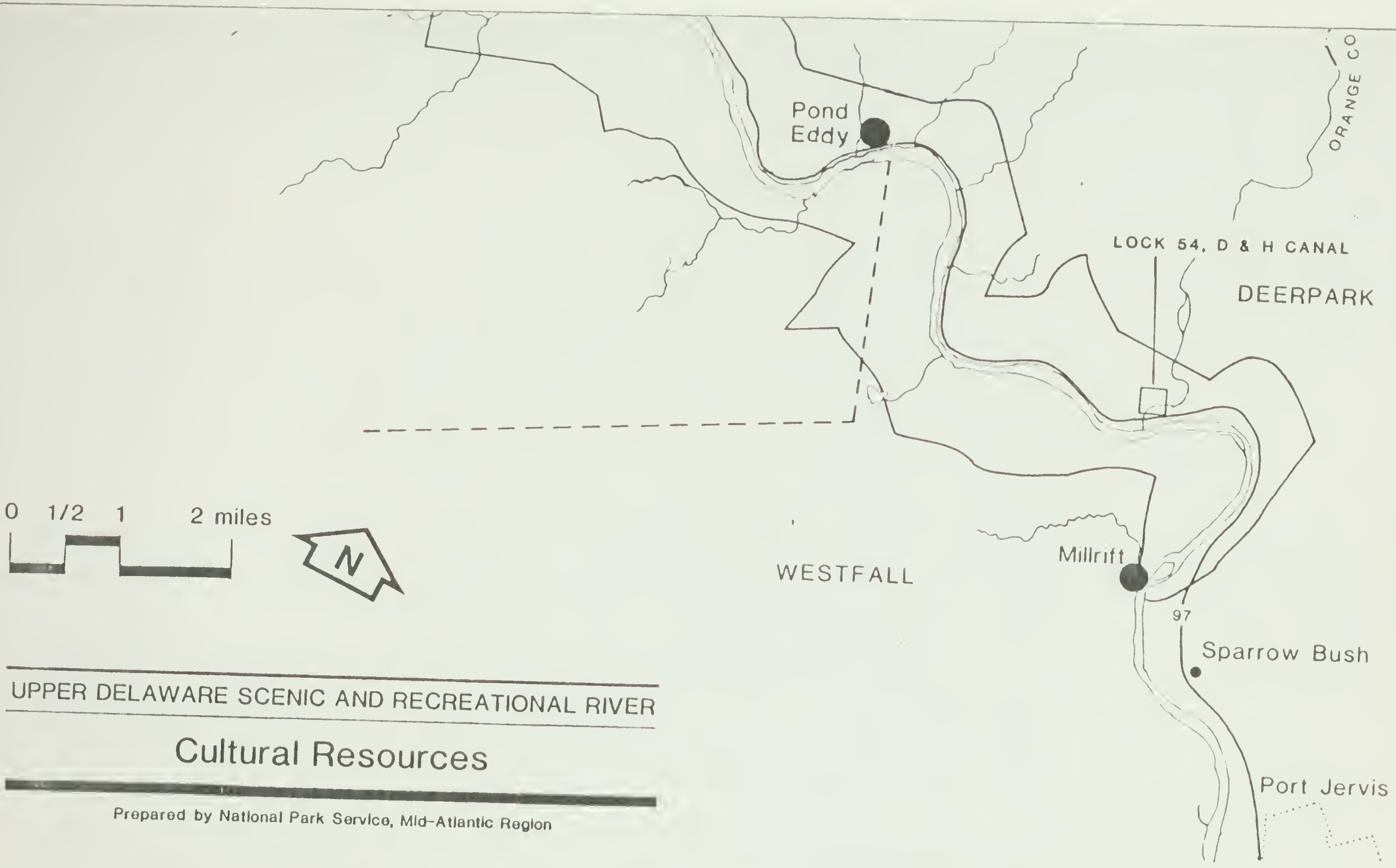
Historic Resources

Many of the corridor's historic resources relate to the 108-mile Delaware and Hudson Canal, five elements of which have been designated as a National Historic Landmark. One of these elements is the Delaware Aqueduct, commonly known as the Roebling Bridge, between Lackawaxen, PA and Minisink Ford, NY. The aqueduct, designed by John Roebling, has also been individually recognized as a National Historic Civil Engineering Landmark. Owned by NPS, the aqueduct is currently undergoing reconstruction, and will be re-opened to light vehicular traffic in the future. Both the aqueduct and the Lordville Bridge have also been listed on the Historic American Engineering Record. Remnants of two of the 18 canal locks within the river corridor (Locks 54 and 72) are proposed for management and interpretation by NPS.

Three individual buildings in the corridor are listed on the National Register of Historic Places: the Zane Grey House in Lackawaxen, the Old Arlington Hotel and the Kirk House in Narrowsburg. One building in Cochecton, the Schultz Round Barn, is listed on the New York State Register of Historic Places (see Table III.7). The toll house on the New York side of the Delaware Aqueduct will be documented as a National Register structure of local significance. National Register sites, hamlets with concentrations of historic buildings, and sites proposed for management or acquisition by NPS or other government agencies/private groups are shown on Map 9.

Historic architectural resources within and around the corridor were inventoried through the Cultural Resource Survey. The survey methodology included a literature search, general architectural inspections and interviews with residents, and more detailed survey, documentation and evaluation of selected sites. The survey inventoried 158 of the approximately 3000 standing structures and buildings in the area. (It should be noted that the survey took in a wider corridor than is included in the proposed River Management Plan; this corridor contains approximately 2700 buildings.) Seventy-seven of these structures were recommended for further study in order to determine their eligibility for National Register nomination.

Historic engineering and industrial sites were also surveyed as part of the Cultural Resource Survey. Sites were identified through a literature



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Cultural Resources

Prepared by National Park Service, Mid-Atlantic Region

HISTORIC AND ARCHEOLOGICAL RESOURCES

MAP 9

search, field-verified, and briefly documented. Of a total of 86 sites surveyed, the majority were archeological, involving surface and buried remains. Most sites related to the transportation systems and industries once important to the valley's economy: the canal and railroad, bluestone quarries, tanneries, sawmills, gristmills, and other hydropowered industries.

The Cultural Resource Survey recommended a number of potential historic districts for further study, including historic districts in the villages of Equinunk, Callicoon, Damascus and Cochecton, and the Stockport settlement. An historic industrial district at the Tusten (Ten Mile River) settlement and two districts representing bluestone quarrying, one at Pond Eddy and one at Kilgour Spur, were also proposed.

Two additional 1981 surveys have identified a number of other sites. In one survey, nine potential historic districts in the Sullivan County portion of the river corridor were identified (USDI, NPS, 1981). This survey also recommended 19 churches (including the St. Joseph's Seminary), railroad stations, hotels, and residences in Sullivan and Pike countries, for further investigation. The second survey noted structures in Equinunk, Lordville, and Masthope with potential National Register significance (Juviler, 1981b). A third survey of historic industrial and engineering sites identified five sites with National Register significance. These included the Stockport Creek complex, the Cornelius Middough sawmill in Millrift, the R. Hankins gristmill ruins, the Kilgour Spur bluestone quarrying complex in Hancock, and the Lordville suspension bridge. (Juviler, 1981a).

Ongoing research has focused on the identification and documentation of these and other historic sites within the corridor. Several New York towns, counties and historical societies, with the assistance of the

National Park Service, are currently inventorying the historic resources of Delaware and Sullivan Counties, and have identified several potential historic districts and individual sites which may be eligible for listing on the National Register as a Multiple Resource Area. This type of listing includes historic resources that are scattered over a wide area, but are linked by common themes.

Table III.7: Historic Architectural Sites

Site Name and Location		National Register	State Register	Management
Zane Grey House	Lackawaxen, PA	X	X	private/leased in part by NPS
Arlington Hotel	Narrowsburg, NY	X	X	private/leased in part by NPS
Kirk House	Narrowsburg, NY	X	X	private
Schultz Round Barn	Cochecton, NY	-	X	private
Delaware Aqueduct	Lackawaxen, PA - Highland, NY	X	X	NPS

F. Scenic Resources

The overall visual impression created by the Upper Delaware is one of tranquil, scenic beauty. Its forested slopes, clear waters, rolling hills, pasturelands, and rural hamlets have not been extensively developed. The river corridor is without major commercial strip development, tall buildings, large power transmission towers, major highways, and large-scale industrial development. The absence of these technological developments emphasizes the rural character of the valley.

The landscape within the river corridor is characterized by gently rolling hills with elevations from 800 to 2,000 feet above sea level, with steep slopes leading down to the river. The uplands remain largely forested, populated primarily by scattered hunting clubs, single-family residences and vacation homes. The valley floors have been more densely settled with farms, rural settlements and river towns. The high quality of the Upper Delaware Valley landscape results from the contrast of farmland and hamlets on the linear valley floors and the forested hills that surround the valley. These scenic qualities are among the reasons for which the river was added by Congress to the National Wild and Scenic Rivers System.

General land development is the greatest potential threat to the scenic resources of the Upper Delaware River Valley. Extensive residential development, industrial uses and major powerlines could alter the character of the rural and natural landscape. The location, type and design of new structures, and the amount of land clearing required, are some of the factors which determine the impacts of development on scenic resources.

G. Socioeconomic Conditions

1. Population Trends

Almost all the towns and townships in the area experienced substantial population gains over the last decade. Several factors have contributed to migration into the area. First, interstate highway construction and general transportation improvements have greatly increased the area's accessibility. Second, the nearby Pocono and Catskill mountains are attractive areas of settlement, particularly for vacationers and retired persons. As a whole, corridor towns and townships have a much greater proportion of persons age 60 and older than do other parts of New York and Pennsylvania (Table III.8). National and regional trends toward population shifts from urban to rural areas have further contributed to population gains in the Upper Delaware River area.

Table III.8: Total Population and Population 60 Years of Age and Older (1980)

Town/Township	1960	1970	Percentage Change 1960-1970	1980	Percentage Change 1970-1980	Population 60 and Over (1980 census)	Percentage of Total Population Over 60*
New York							
Delaware County							
Hancock	3,907	3,604	- 7.8	3,497	- 3.0	744	21.3
Orange County							
Deerpark	2,777	4,370	+57.4	5,633	+28.9	977	17.3
Sullivan County							
Cochecton	1,070	1,181	+10.4	1,330	+12.6	325	24.4
Delaware	2,141	2,260	+ 5.6	2,783	+23.1	575	20.7
Fremont	1,047	1,047	0.0	1,346	+28.6	314	23.3
Highland	1,138	1,377	+21.0	1,878	+36.4	559	29.8
Lumberland	538	857	+59.3	1,210	+41.2	355	29.3
Tusten	1,087	1,224	+12.6	1,424	+16.3	476	33.4
Pennsylvania							
Pike County							
Lackawaxen	1,068	1,363	+27.6	2,111	+54.9	583	27.6
Shohola	413	574	+39.0	986	+71.8	307	31.1
Westfall	838	1,348	+60.9	1,825	+35.4	361	19.8
Wayne County							
Berlin	1,010	1,109	+ 9.8	1,676	+51.1	366	21.8
Buckingham	593	578	- 2.5	667	+15.4	150	22.5
Damascus	1,703	2,006	+17.8	2,536	+26.4	572	22.6
Manchester	558	494	-11.5	629		133	21.1
Totals	19,888	23,392	+17.6	29,531	+26.2	6,797	23.0

Source: Totals from 1960, 1970, and 1980 Censuses of Population, Bureau of the Census, U.S. Department of Commerce.

*For the New York towns in the corridor, the percentage of total population over age 60 is 22.6, while for the state it is 13.2; for Pennsylvania townships the percentage is 23.7, while for the state it is 18.2.

As the total population figures demonstrate, out of the 15 Upper Delaware municipalities, only Hancock, NY lost population from 1970 to 1980. Most other municipalities realized substantial population increases, with three townships -- Lackawaxen, Shohola, and Berlin -- gaining 50% or more in total population during this period. In the 1970's, Pike County was the fastest-growing county in Pennsylvania, with a 55% population increase. Wayne County showed a 19% increase, while the statewide population gain was less than 1%. In New York the northernmost county in the corridor, Delaware County, grew by only 5% in the 1970's, but the other two counties showed high growth rates: a 24% increase in Sullivan County and a 17% increase in Orange County.

Both New York and Pennsylvania have made projections of population growth for river corridor municipalities through the year 2000. These projections were made by the New York Department of Environmental Conservation, Bureau of Water Quality Management, and the Pennsylvania Department of Environment Resources, Bureau of Water Quality, as part of the planning process for new water and sewer treatment facilities. The projected population changes for the two states differ because they are based upon different assumptions and statistical methods. Most of the Pennsylvania townships are expected to show population gains of about 7% by the year 2000, while the New York town projections range from a a decline of 3% in Hancock to an increase of 23% in Deerpark (see Appendix C. Table C.1). Pennsylvania water quality analysts have stated that Pennsylvania projections are probably too low in light of the rapid growth experienced by Wayne and Pike Counties in the 1970's (Hayden, 1985). The Pennsylvania State Data Center in fact predicts an 86% increase in Pike County's population and a 38% increase in Wayne County's during this time period (Pennsylvania State Data Center, 1985).

2. Socioeconomic Characteristics of Landowners

The majority of respondents to two 1980 landowner surveys* conducted in the Upper Delaware River area were above 45 years of age with secondary education and white collar occupations.** Three quarters of the landowners surveyed were 45 years of age or older (Table III.9). Approximately 4 out of 5 landowners had completed high school and over one-half of the high school graduates had some college education (Table III.10). One-third of the respondents were retired or disabled, one-third were in white collar positions, and the remaining one-third were in a variety of occupations ranging from farmers to housewives to craftsmen (Table III.11). About one-half of the respondents reported 1979 family incomes of $20,000 or more (Table III.12).

Forty-eight percent of landowners lived on or near their property and 52% were absentee landowners living entirely outside the river corridor. Landowners cited a variety of reasons for owning land. Residents primarily owned land as a permanent residence, while absentee owners indicated recreation as a major reason. Other reasons for owning land were its development and investment potential and use as a future place of residence.

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*"Characteristics and management preferences of landowners along the Upper Delaware Scenic and Recreational River," D.J. Decker, C.P. Dawson, and R.A. Smolka, Jr., 1981. A more recent (1985) landowner Survey, "A Report on the 1984 Landowner Survey along the Upper Delaware River," focuses on landowner management preferences and concerns rather than socio-economic characteristics. This study was prepared by Foresight Consulting Group for the Conference of Upper Delaware Townships.

**A questionnaire was mailed to 1,298 randomly selected individuals living within one mile of the Upper Delaware River. Nine hundred and forty-five (73%) questionnaires were returned and useable for analysis.

TABLE III.9: AGE OF UPPER DELAWARE RIVER AREA RIPARIAN* AND NONRIPARIAN LANDOWNERS (1980)**

	LANDOWNER			
	RIPARIAN		NONRIPARIAN	
AGE	PERCENT	NUMBER	PERCENT	NUMBER
24	0.5	2	0.4	2
25-34	6.0	25	7.3	35
35-44	15.1	63	17.3	83
45-54	23.6	98	22.2	107
55-64	24.7	103	22.9	110
65-74	22.4	93	20.8	100
75	7.7	32	9.1	44
TOTAL	100.0	416	100.0	481

TABLE III.10: YEARS OF SCHOOL COMPLETED BY UPPER DELAWARE RIVER AREA RIPARIAN AND NONRIPARIAN LANDOWNERS (1980)

	LANDOWNER			
	RIPARIAN		NONRIPARIAN	
YEARS OF SCHOOL	PERCENT	NUMBER	PERCENT	NUMBER
8	8.5	35	11.4	54
9-11	9.0	37	12.4	59
12	32.0	132	36.9	175
13-16	31.8	131	28.8	137
17	18.7	77	10.5	50
TOTAL	100.0	412	100.0	475

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* Riparian landowners are all individuals in the survey who own land adjacent to the Upper Delaware River.

**This study defines the Upper Delaware River area as a 2-mile and 75-mile long corridor from the confluence of the east and west branches of the Upper Delaware River at Hancock, New York to Cherry Island near Sparrow Bush, New York.

Source: "Characteristics and management preferences of landowners along the Upper Delaware Scenic and Recreational River," D.J. Decker, C.P. Dawson, and R.A Smolka Jr., Outdoor Recreation Research Unit of Department of Natural Resources, New York State College of Agricultural and Life Sciences. Cornell University, Ithaca, NY:, 1981., p.6.

TABLE III.11: OCCUPATIONS OF UPPER DELAWARE RIVER AREA RIPARIAN AND NONRIPARIAN LANDOWNERS (1980)

	LANDOWNER			
	RIPARIAN		NONRIPARIAN	
OCCUPATION	PERCENT	NUMBER	PERCENT	NUMBER
PROFESSION-TECHNICAL	25.2	101	16.4	77
MANAGER - PROPRIETOR	7.5	30	7.8	37
SALES - CLERICAL	6.0	24	6.8	32
TRADES - FOREMAN	6.2	25	9.8	46
OPERATORS	2.7	11	4.4	21
SERVICE WORKERS	2.2	9	2.7	13
LABORERS	1.7	7	2.1	10
FARMERS	1.7	7	2.5	12
SELF-EMPLOYED	6.7	27	7.8	37
HOUSEWIVES	5.5	22	6.3	30
STUDENTS	0.2	1	0.6	3
RETIRED - DISABLED	34.4	138	32.4	153
UNEMPLOYED	0.0	0	0.4	2
TOTAL	100.0	402	100.0	473

TABLE III.12: 1979 FAMILY INCOME OF UPPER DELAWARE RIVER AREA RIPARIAN AND NONRIPARIAN LANDOWNERS

	LANDOWNER			
	RIPARIAN		NONRIPARIAN	
FAMILY INCOME	PERCENT	NUMBER	PERCENT	NUMBER
< $5,000	6.3	21	8.4	34
$5,000 - $9,999	13.7	46	13.1	53
$10,000 - $14,999	13.1	44	16.9	68
$15,000 - $19,999	15.6	52	14.1	57
$20,000 - $24,999	13.4	45	11.9	48
$25,000 - $29,999	10.7	36	10.1	41
$30,000 - $39,999	12.5	42	11.9	48
$40,000 & over	14.7	49	13.9	55
TOTAL	100.0	335	100.0	404

Source: "Characteristics and management preferences of landowners along the Upper Delaware Scenic and Recreational River," D.J. Decker, C.P. Dawson, and R.A Smolka Jr.,

3. Regional Housing Trends

Between 1970 and 1980 the Upper Delaware municipalities realized a marked increase in the number of total housing units available (Table III.13). Numerous townships in Wayne and Pike counties as well as the towns of Delaware and Tusten gained a higher percentage of total housing than of permanent population during the same period. Much of this can be attributed to second-home and retirement home development within these areas, as well as to the nationwide trend of declining household size.

The market for second and retirement homes basically results from the area's recreational and scenic values, and its good highways which bring it within two to four hours driving time from New York City and other metropolitan areas. This market is further stimulated by housing prices lower than the average median value in either state (Table III.13), and by lower local real estate taxes. Seasonal homes now make up 30% of the total housing stock in the Upper Delaware municipalities.

Land subdivisions for second and retirement homes gradually began in the 1960's and reached a peak in the early 1970's. Filings for subdivisions between 1971 and 1975 proved to be the highest during any five-year period from 1960 to 1980. This increase in activity coincided with improved highway access and with relatively inexpensive gasoline. From 1976 to 1981 a low subdivision filing rate was recorded. High fuel costs, the economic recession, and high interest rates all contributed to the decline in second home development during this period.

Aerial photographs and topographic maps were analyzed to determine the number of residences within the proposed river corridor boundary in 1965 and 1983. There are at present some 2,459 housing units within the boundary (although it is impossible to determine exactly how many are

Table III.13: Number of Total and Seasonal Housing Units Within Towns and Townships

Town/Township	Total Units 1970	Total Units 1980	Percentage Change	Total Seasonal Units (1980)	Percentage Seasonal Units of Total Units	Median Value of Owner-Occupied Housing*
New York						
Delaware County						
Hancock	1,728	2,035	+17.8	571	28.0	$25,100
Orange County						
Deerpark	1,796	2,445	+36.1	270	11.0	34,300
Sullivan County						
Cochecton	964	817	-15.2	275	33.7	34,500
Delaware	1,009	1,167	+15.7	231	19.8	35,400
Fremont	749	843	+12.6	304	36.1	29,900
Highland	992	1,271	+28.1	446	35.1	40,500
Lumberland	805	1,079	+34.0	442	41.0	38,800
Tusten	742	943	+27.1	341	36.2	37,700
Pennsylvania						
Pike County						
Lackawaxen	994	1,526	+53.5	629	41.2	44,200
Shohola	627	867	+38.3	433	49.9	48,600
Westfall	576	833	+44.6	138	22.2	45,100
Wayne County						
Berlin	478	792	+65.7	164	20.7	41,700
Buckingham	300	393	+31.0	137	34.9	30,000
Damascus	935	1,535	+64.2	560	36.5	41,300
Manchester	248	439	+77.0	212	48.3	32,300
Totals	12,943	16,985	+31.2 avg	5,153	30.3 avg	$37,300 avg

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*New York State average median value is $45,900; Pennsylvania, $39,100.

Source: Totals from 1980 Census of Housing, Bureau of the Census, U.S. Department of Commerce.

currently inhabited), of which at least 654 (27%) were built during this 15 year period.* This figure represents a 37% increase over the number of housing units in the corridor in 1965. The percentage of each town's total housing units that are found within the river corridor can also be estimated (although only 1980 figures are available for total housing units townwide). This percentage ranges from 1% (Berlin) to 37% (Tusten).

Future growth in new residential construction for the 20-year planning period can be projected using the somewhat conservation population projections discussed in Chapter IIIG.1 combined with assumptions about growth in second homes. It has been estimated that second home development will continue to increase by approximately 20% per decade between now and the year 2000 (Munley and Aronson 1985). Assuming that this trend is correct, and that the current trend toward small household continues, total housing units in the corridor should increase by approximately 25% over the 1983 totals by the end of the planning period. (For a complete explanation of how this estimate was arrived at, see Appendix C).

4. Land Use and Landownership

Land Use

As shown on Map 10 the Upper Delaware River corridor is approximately 73% forested land. Forest vegetation is divided nearly equally between deciduous and mixed coniferous/deciduous stands, with a few small coniferous stands within the corridor. This forest cover provides watershed protection, wildlife habitat, and timber. About 22% of the annual timber growth is harvested. Several sites southwest of the Narrowsburg area have recently been logged; several areas north of Equinunk and adjacent to the northern edge of the river corridor have also been cut.

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* Information on new construction was not available for most of the hamlet areas, so that this figure represents mainly scattered, rural housing.

Three and a half percent of the land is in cultivated cropland. The majority of this land is devoted to dairy farming, vegetable production, and poultry raising. Although farmlands are located throughout the entire corridor, 65% of the agricultural activity occurs between the settlements of Hancock and Narrowsburg.

About 6% of the river corridor consists of various types of residential and commercial development; 5% consists of land in hamlets, and the remaining 1% consists of camps, seasonal cabins, picnic areas, boat and canoe rental structures, and other dispersed settlements. The remaining 18-19% of the corridor consists of other open land--river floodplain, pastures, old fields, and vacant land. Most new development (68%) in the period 1968-83 occurred on former forest land. State highway 97, located on the New York side, has contributed to new development; the Pennsylvania side retains a more rural character.

Landownership

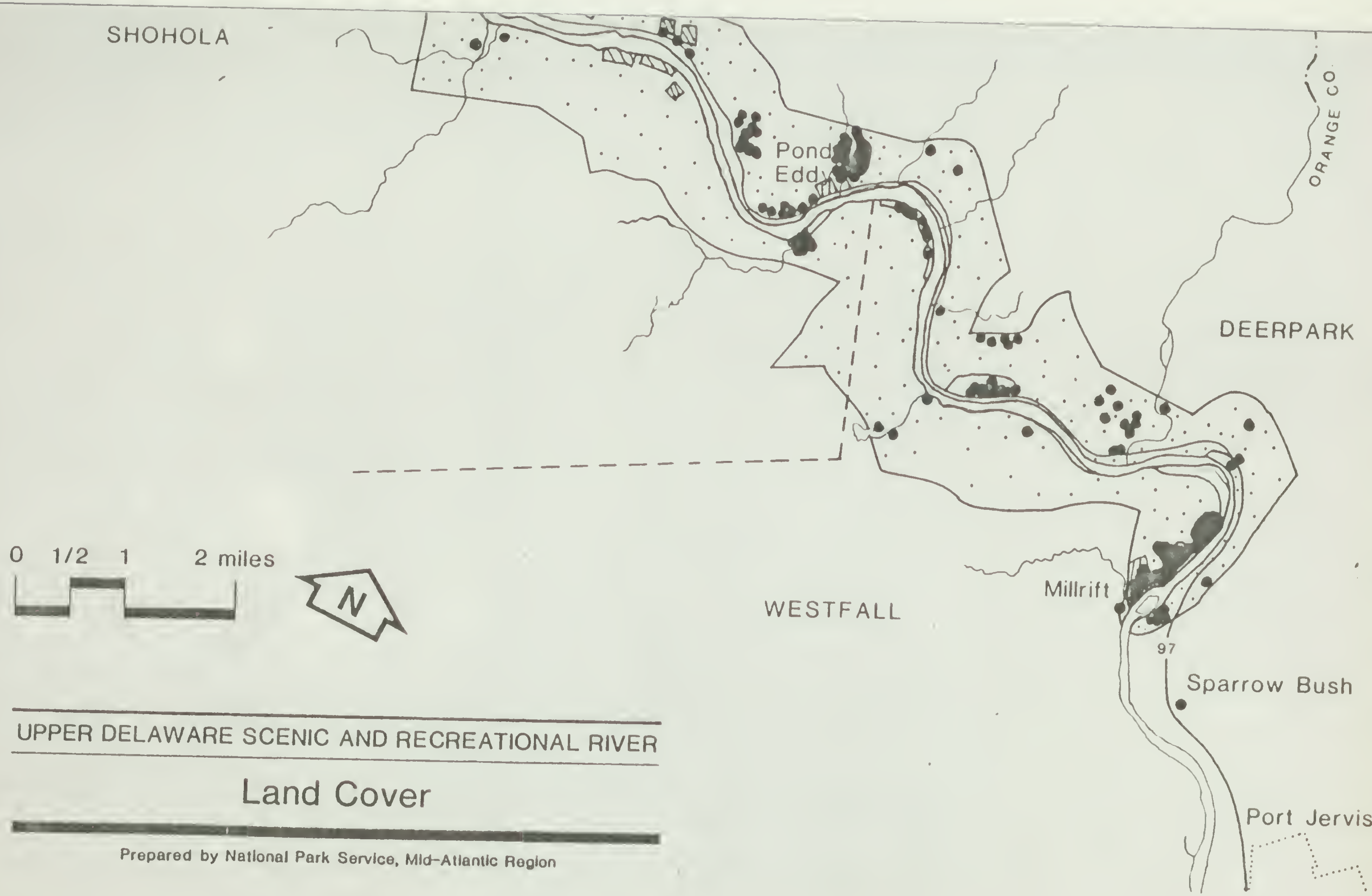
One of the outstanding characteristics of the Upper Delaware River corridor is the large extent of private ownership of land. Over 95 percent of the land in the Upper Delaware corridor is owned by private individuals. A significant portion of this land is used for camps and hunting clubs.

The ownership pattern is dominated by individual, small tract ownership, although Westfall, Shohola, and Lackawaxen townships have several tracts of over 1,000 acres within their boundaries. These larger tracts are owned by the Pennsylvania Game Commission, hunting clubs, and a private resort development.

Land use in the river corridor municipalities is regulated primarily through local authorities: town, township and county governments. Different sets of state codes and regulations apply in Pennsylvania and New

LAND COVER

MAP 10



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

Land Cover

Prepared by National Park Service, Mid-Atlantic Region

York; the principal state laws and programs affecting land use in each state are described in Appendix D.

5. Community Services

Law Enforcement

Pursuant to the Upper Delaware legislation, the National Park Service (NPS) provides financial assistance to local governments for law enforcement services related to river recreation use. Between 1980 and 1985, over $1,028,751 was provided. NPS rangers' jurisdictional responsibilities are limited to the river and NPS-owned or leased property. On the river, NPS rangers patrol and enforce existing federal and state boating laws and state fishing and hunting laws.

Table III.14 is a summary of violation notices and courtesy tags issued by NPS rangers. Most of the violations issued were for lack of a Personal Flotation Device (PFD) or for fishing without a license. The chart also shows the number of litter violations which are a major concern of landowners. Although warnings are made for trespass, NPS rangers do not have jurisdiction on private land, so citations are not issued. Rangers also make numerous informational contacts with visitors in addition to law enforcement activity.

Most Upper Delaware communities are currently unable to maintain the costs of a full time police force. In some instances, constables are hired to provide limited services, or sheriff's deputies and state police are called upon to provide police functions. Two municipalities, Deerpark and Westfall, had police protection (other than state police in Pennsylvania or county sheriffs in New York) prior to NPS contracts. Four others, Lumberland, Highland, Tusten, and Hancock, had limited constable/police protection. Although constables and the state police supply a needed service, frequency of patrol, length of response time, and types of services vary.

Table III.14: Summary of NPS Violation Notices/Courtesy Tags*

Violation Notice Breakdown	**81**	**82**	**83**	**84**	**85**
Littering/Polluting	59/26	64/24	85/141	47/8	49/2
PFD's	41/89	80/249	131/97	35/49	11/8
Boating Violations	0/3	0/0	1/4	0/0	0/2
Fishing without a License	19/91	65/72	123/19	46/18	43/27
Fishing Violation other than license	0/1	2/0	3/1	0/0	0/0
Illegal Hunting	0/0	0/0	1/0	0/0	0/0
Wildlife, Disrupt, Capture, Kill	0/0	0/0	2/0	0/0	0/0
Possession of Controlled Substance	7/7	2/2	6/0	40/2	53/1
Possession of Alcohol (underage)	0/0	0/0	0/0	3/0	0/0
Drunk, Under the Influence	1/2	0/0	7/0	0/0	3/0
Disorderly Conduct	1/0	1/0	5/0	3/2	5/0
Unauthorized Possession of Firearms	5/1	0/0	3/0	0/0	1/0
Fireworks	1/5	15/6	12/1	19/1	13/3
False Information	2/0	1/0	7/0	4/0	13/0
Tampering, Unlawful Possession	0/0	3/2	5/1	2/0	0/0
Trespassing (Roebling Bridge closed during Construction)	0/0	0/0	0/0	0/0	5/2
Miscellaneous	1/2	1/0	0/0	2/0	1/1
Violation Notices/ Courtesy Tags: TOTALS	137/227	234/355	391/134	201/80	197/46
Total River Area Visitation	151,218	107,288	225,959	162,490	157,~~556~~ 711 ~~(thru 11/85)~~

*Courtesy tags are written warnings with no fines.

Table III.15 shows the number of law enforcement contacts made by local government constables and police. Because local governments have jurisdiction over private land, they deal with trespass problems as well as litter, theft, accidents and other problems. Numerous informational contacts are also made by local law enforcement.

Table III.15: Local Law Enforcement Activity (NPS funded)

Year	# of Contacts	Trespass	Littering
80	N.A.	N.A.	N.A.
81	867	N.A.	N.A.
82	1105	211	143
83	2436	367	58
FY 84	2740	557	43

Source: National Park Service, Upper Delaware Scenic and Recreational River, Annual Reports.

Solid Waste Removal

Solid waste removal in the river towns and townships is primarily performed by private haulers with designated stops. To minimize litter problems caused by recreationists in the corridor, the National Park Service is legislatively authorized to financially assist river municipalities for the removal and proper disposal of solid waste. Between 1980 and 1985, over $300,000 was provided to local governments in the corridor area under the local trash removal program. Each community is responsible for developing its own program to collect solid waste. Table III.16 shows the amount of solid waste which was collected by local governments.

The National Park Service has entered into cooperative agreements with the New York State Department of Environmental Conservation and the Pennsylvania Fish Commission to operate information kiosks at several of their river access points during the canoe season. As part of this agreement, solid waste pickup is the responsibility of the National Park Service when it is maintaining kiosks at the access sites.

Table III.16: Local Trash Removal Program (NPS funded)

Summary

Fiscal Year*	Cubic Yards of Trash Removed
80	950
81	1069
82	1407
83	1397
84	659

Source: National Park Service, Upper Delaware Scenic and Recreational River, Annual Reports.

* The NPS Fiscal Year begins on October 1.

Hospital Facilities

The only hospital facility within the river corridor is located along New York Highway 97 in the town of Delaware. Other nearby hospital facilities are located in Port Jervis and Honesdale.

Water Service

Most residents in the river corridor are served by individual water wells. However, the settlement areas of Long Eddy, Callicoon, and Narrowsburg have central water distribution systems that are all supplied through community wells. Once the water has been pumped, it is held in storage tanks, chlorinated, and then put into the distribution systems.

6. Fiscal Status and Taxes

The seven Pennsylvania townships and eight New York towns in the Upper Delaware corridor are rural governments that provide minimal services. The major local function in both states is road maintenance. Refuse collection and law enforcement services do not receive major public financing. The NPS partially finances refuse collection services and contributes funds towards provision of law enforcement services.

The most recent year for which data on township expenditure patterns is available is 1982. These patterns are presented in the report entitled

"Impact of the River Management Plan on the Finances of Local Governments in New York and Pennsylvania" (an Appendix to the River Management Plan). Municipal revenues in New York are generated primarily from property taxes and intergovernmental revenues. Pennsylvania townships also receive funds from both these sources, but receive additional revenues from Act 511 taxes, which include such items as per capita taxes, earned income taxes, and real estate transfer taxes.

Expenditure patterns are similar for municipalities in New York and Pennsylvania. The largest expenditure item for towns and townships is highways. Funds falling under this category are used for maintenance and improvement of town roads and bridges, snow removal, street lighting and public transportation. Highway expenditures amount to more than one-half of total budget outlays for most townships. Government administration expenditures are a significant item in township budgets. Under this heading expenditures are made for executive, legislative, judicial, and financial operations. Municipal expenditures for police and fire are as high as 10% of total budget in some cases.

Existing expenditure patterns indicate that a significant relationship exists between summer visitors, seasonal residents, retirement population, and municipal expenditures. Increases in visitation, second home development and retirement population lead to an increase in highway expenditures. Increases in retirement population are paralled by increases in expenditures on government administration, fire protection, and sanitation.

In 1982 municipal finance reports, seven townships reported annual line item expenditures for zoning and planning. The average annual expenditure for this group was $1557. Individual values ranged from a low of $192 to a high of $3213.

7. The Land Market

The National Park Service, at the request of the Citizens' Advisory Committee, contracted with Coughlin, Keene, and Associates to determine how implementation of the River Management Plan would affect the Upper Delaware land market. Coughlin and Keene's study, "The Effects on the Land Market of the River Management Plan for the Upper Delaware National Scenic and Recreational River" (September 1985) focused on undeveloped land within the river corridor, exclusive of settlement areas. The study identified the following existing trends in the Upper Delaware land market.

Existing Trends in the Upper Delaware Land Market

A typical characteristic of a land market that is rural or undeveloped is that individuals rather than investors or developers comprise the largest potential buyers. This is the case in the Upper Delaware area, where individuals account for 95-99% of the acreage sought. This is significant because of the preference patterns of individuals related to plot size and intended use of the land. In the Upper Delaware land market, 80-90% of potential land purchasers are seeking second homes, to eventually be used as retirement dwellings, while 10-20% of consumers want year round residences. The preference patterns for these two groups of land purchasers are identified in the study as follows:

purchasers of second homes: 3 or more acres
purchasers of year round homes: 2-5 acres

Real estate activity in the corridor is light, since much of the land is steep and difficult to develop. The number of sales is small considering the size of the study area. However, comparison of the six years prior to designation as a National Scenic and Recreational River (1973-78) with the six years following designation (1979-84) reveal that the number of sales increased by over 200% for tracts between .3-.8 acres and by 70% for larger tracts.

Prices of land have increased steadily every year since 1977, with one estimate identifying a 10% annual rise. The table below summarizes the median selling price of tracts per acre.

MEDIAN SELLING PRICE OF TRACTS PER ACRE	**EARLY 70's**	**LATE 70's**	**EARLY 80's**
tracts 5 or more acres	$600-$1,200	$800-$1,000	$1,000-$1,400
tracts less than 5 acres	$1,000-$2,000	$1,500-$2,500	$2,000-$3,000

To summarize, the Upper Delaware land market is dominated by individuals seeking second and permanent homes, is characterized by light real estate activity, and has experienced increases in both land prices and the number of transactions since at least 1977.

CHAPTER IV - ENVIRONMENTAL CONSEQUENCES

A. Introduction

The Environmental Consequences section provides the analytical base for comparing the alternatives. The consequences of implementing each alternative for the Upper Delaware River are presented. Environmental topics were chosen based on a series of scoping meeting as described in Chapter V.

B. Assumptions

For the purpose of analysis and evaluation of alternatives in this DEIS, the National Park Service (NPS) has made several assumptions regarding future amounts of residential development and recreational use in the Upper Delaware river corridor.

The projections of future residential development were based on a review of county and state population and housing data. The EIS team assumed that present rates of housing development would level off over the next 20 years, consistent with expected population trends. Based on present projections it is therefore expected that a 25% increase in housing units would occur between 1983 and 2005.

The EIS team also projected river-related recreational use over the next 20 years. Based on past trends, the EIS team projected a 2.5% annual increase in recreational use, representing an increase of 64% between 1983 and 2005. Population, housing, and recreational use projections are described in detail in Appendix C.

C. Alternative 1: Implement the Proposed RMP

1. Impacts on Fisheries

Introduction

High water quality, coldwater releases from upstream tributaries, and free-flowing character make the Upper Delaware one of the finest fisheries rivers in the eastern United States. Approximately 40 miles of tributary streams exist within the river corridor, providing spawning and nursery habitat for both coldwater fish (brown, rainbow, and brook trout), and warmwater fish (smallmouth bass, eel, sunfish, and walleye). The mainstem of the Upper Delaware provides important spawning and nursery habitat for the American shad, an anadromous fish with annual migrations of up to 500,000 fish. Several tributaries in New York State (Basket Creek, Hankins Creek, Callicoon Creek, and the Mongaup River) have spawning habitat for rainbow and brown trout which is biologically important to the fisheries of the main stem. All tributaries on the Pennsylvania side of the river, except for the Lackawaxen River, have been designated as "exceptional value," "high quality," or "coldwater fishery." Factors contributing to the productivity of these areas include high water quality, deep pools, riffle areas and a rubble-boulder bottom substrate. Most impacts on fisheries habitat are expected to be caused by new residential development, and to occur on tributary streams, where most fish spawning habitat is located.

Impacts from New Residential Development

New residential development can adversely affect fisheries through soil erosion and siltation of important habitat. Increased rates of soil erosion can result from vegetative clearing and construction activities on steep slopes and on riverbanks and ridgelines. Large sediment loads carried by stormwater runoff can cause siltation of fisheries spawning and feeding habitat.

Within the past 15 years, 654 new housing units have been built in the river corridor. Based on the present excellent water quality readings and the opinions of fisheries biologists in New York and Pennsylvania, present levels of residential and commercial development have had minimal impacts on fisheries resources.

The number of residential structures within the Upper Delaware River corridor is projected to increase by approximately 25% during the next 20 years, an increase of about 625 housing units.

Local land use provisions regulating new construction on steep slopes in conformance with the Land Use Guidelines would be projected to be in effect in about 85% of the river corridor. Similarly, zoning provisions controlling new construction within 100 feet of the river, in conformance with the Guidelines, would cover about 85% of the corridor. Scattered erosion problems associated with new construction could be expected in the remaining 15% of the corridor. As a result, minor losses of trout fisheries habitat might occur on a small number of tributary streams to the Upper Delaware.

Impacts from Incompatible Uses

Incompatible uses listed in the proposed Land and Water Use Guidelines can have adverse effects on fisheries. Specific land uses with potentially deleterious effects on the fisheries of the Upper Delaware include impoundments, channel modifications, power plants, landfills, major mining operations, and heavy industrial uses. Section 7 of the National Wild and Scenic Rivers Act would preclude federally licensed water resource projects (including impoundments and channel modification projects) which would alter the free-flowing characteristics of the Upper Delaware. New major mining operations and heavy industrial uses would likely be precluded by local land use ordinances in approximately 85% of the river corridor. Proposed incompatible uses (such as major mining or heavy industry) in towns not in conformance with the Guidelines could be blocked through use of condemnation. This would be a last resort measure, however, and would require review by the Management Council.

Conclusion

The overall quality of Upper Delaware fisheries would be maintained through the requirements of Section 7 of the Wild and Scenic Rivers Act and through local zoning consistent with the Land and Water Use Guidelines. Minor losses of trout fisheries habitat on a few tributary streams may occur from residential construction activities.

2. Impacts on Water Quality

Introduction

Water quality data indicate that the Upper Delaware basin has good to excellent water quality. (See Chapter III/C.7.) The entire main stem of the Upper Delaware meets federal "fishable and swimmable" water quality goals.

Due to the rural character and low population density of the river corridor, with an economy largely based on tourism, agriculture, and small service-oriented businesses, the area suffers from only minor localized water quality problems. These non-point source pollution problems are primarily caused by agricultural runoff and malfunctioning on-lot residential sewage disposal systems.

For example, elevated levels of fecal coliform of up to 736/100 milliliters and fecal coliform/fecal streptococcus ratios of up to 6.20 have been recorded on Callicoon Creek, within the hamlet of Callicoon. These water quality effects, thought to be caused by poorly treated septic effluent from the hamlet area, are considered only minor problems by the Delaware River Basin Commission. New York state water quality standards for bacteria in Callicoon Creek require monthly median coliform levels not to exceed 10,000/100 milliliters.

Impacts from New Residential Development

Future residential development could adversely affect water quality primarily through nutrient loading from on-lot septic disposal systems or discharges from sewage treatment plants. Of the 17 hamlets within the corridor, only Narrowsburg has a sewage treatment facility; the hamlet of Hancock, located largely outside of the river corridor, has a sewage treatment facility which discharges into the East Branch Delaware River.

The majority of homes within the river corridor rely on individual sewage disposal systems. According to the Soil Conservation Service system of soil classification, most soils within the corridor have severe limitations for septic systems, due to factors such as seasonal high water tables, slow permeability, steep slopes, flooding, and/or stoniness. Based on SCS soil classifications, only approximately 10% of the soils in the river corridor are suitable for on-lot septic systems. These areas are primarily found on valley lowlands adjacent to the main stem of the Upper Delaware. Of the 591 new residential structures constructed outside hamlet areas in the river corridor between 1968 and 1983, approximately 60% appear to have been constructed on soils with septic limitations. However, major negative effects on surface water quality have not been observed. This can probably be attributed to the low density of development and seasonal (primarily summertime) use of most of these new homes. Furthermore, due to the generalized nature of the SCS soil survey data, pockets of suitable soils can be found in areas otherwise having severe limitations. In addition, soil percolation tests required for new residential development help to insure that septic systems are constructed in suitable soils.

Under this alternative, it is projected that towns encompassing 85% of the river corridor would adopt local zoning provisions in conformance with the Land Use Guidelines' standard that residential lots outside of hamlets be a minimum of 2 acres in size. This would serve to ensure an overall low density development pattern.

As observed in other locations of the Upper Delaware basin, land use conversion from forest to low density residential development which occurs in tributary watersheds generally results in increases of fecal coliform on the order of 20 to 60 parts per 100 milliliters. This would be well within DRBC water quality standards for the main stem of the Upper Delaware which require fecal coliform to not exceed an average of 200 per 100 milliliters.

Residential development can have short term effects on water quality from soil erosion occurring during construction. Measures contained in the Land

Use Guidelines to minimize soil erosion were described under Section C.1 ("Impacts on Fisheries").

Impacts from Incompatible Uses

Under this alternative, it is estimated that about 85% of the river corridor would be covered by zoning ordinances precluding incompatible uses which could have potentially significant effects on water quality. Such uses would include heavy industrial uses, junkyards, and landfills. Within the remaining 15% of the river corridor not in conformance with the Guidelines' list of incompatible uses, condemnation could be used as a last resort to block a proposed incompatible use. Management Council review would be required prior to use of condemnation.

Impacts from Recreational Facilities Development and Use

Limited short term soil erosion and siltation may occur from construction of new public recreational facilities at selected locations along the Upper Delaware. Under this alternative, three river rest areas, four fishing access sites, two bridge parking areas, and a visitor contact facility would be developed by NPS; in addition, the existing NPS headquarters complex would be completed, and two permanent ranger stations would be established. Preparation of professional engineering plans by NPS, and site plan review by local governments, would limit the amount of site disturbance during construction and minimize effects on water quality.

Conclusion

Application of the provisions in the Land Use Guidelines through local zoning ordinances would maintain the high water quality of the river corridor. Minor temporary localized effects may occur in certain tributary watersheds from soil erosion and sediment loading during residential construction. Minor increases in nutrients and fecal bacteria may occur in tributaries from increased construction of on-lot septic systems.

3. Impacts on Important Species

Introduction

The Upper Delaware river corridor provides an environment that enables a wide variety of vegetation and wildlife species to exist. Although none of the plant or mammal species that permanently reside in the corridor are identified on Federally endangered or threatened species lists, two Federally endangered bird species visit the area, the bald eagle and the American peregrine falcon. (See Chapter III/C.10). No permanent critical habitat areas for these species have been defined within the corridor. However, the bald eagle does inhabit the Hawks Nest area and an area near the mouth of the Mongaup River for a portion of the year.

Several plant or tree species that are found within the corridor boundaries, such as Chamissio's miner's lettuce in Pennsylvania, and Great St. John's Wort, river birch and sand cherry in New York, are considered rare on the state level. In a similar manner, the osprey is classified as an endangered species by the State of New York, while the river otter is listed as "of special importance."

Habitat for almost all of these species is found within 100 feet of the river or within the 100 year floodplain. In addition, numerous islands in the Delaware River provide locations for several rare natural communities, including the Great St. John's wort, sand cherry, and river birch. The timber rattlesnake, listed as threatened by the State of New York, lives in dens on steep slopes above the river.

Impacts from New Development

Local land use controls conforming to the Land and Water Use Guidelines would serve to mitigate adverse impacts from new development on the above-mentioned species habitat by: requiring review of proposed new structures within 100 feet of the mean high water mark; preventing the development of certain incompatible land uses; and requiring review of proposed new structures on slopes of 15% or greater in grade. Limitations on development along riverbanks would be critical to maintaining the existing habitat of most regionally important species, as well as the bald eagle habitat. Under the proposed action it is expected that about 85% of the river corridor would be subject to local ordinances controlling new development within 100 feet of the mean high water mark and prohibiting the development of incompatible uses. For species not located in proximity to the river, the Upper Delaware Management Council's review of conditional use proposals for steep slope development would offer a degree of protection, which would be valuable in protecting the habitat of the bald eagle, the American peregrine falcon, and the timber rattlesnake. Future development occurring within the portions of the river corridor not covered by such ordinances or provisions may result in the loss of important species habitat in those areas, especially habitats of the Great St. John's Wort and sand cherry.

Impacts from Recreational Facilities and Use

Under the proposed action, fifteen recreational, visitor and interpretive facilities would be developed by NPS on about 130 acres (see Map 3 for general locations). All new public facilities would be sited to minimize negative effects on regionally important species habitat.

In addition to public facilities, it is expected that private recreational facilities such as campgrounds and liveries would locate near the river. Under this alternative, new intensive use recreation areas would be prohibited on all scenic segments. In addition, local site plan review of new facilities in recreational segments would be required, providing an opportunity to avoid or minimize the destruction of important species habitat.

Recreational users, however, may have some impact on the general river habitat of the river otter and on species that inhabit the islands and the floodplain area because of trampling or inadvertent destruction of the species habitats. NPS is presently conducting a study to determine the impacts of recreational use on the Upper Delaware river environment.

Conclusion

Important species habitat in about 85% of the corridor would be largely protected from potential loss or damage due to new development. Impacts from recreational use, while potentially significant, would be minimized through the careful siting of new facilities.

4. Impacts on Scenic Resources

Introduction

The scenic qualities of the Upper Delaware river corridor are largely a product of its diversity -- its blend of natural and cultural landscapes. Important scenic elements of the river corridor include rolling uplands, steeply sloping valley walls with dense forest cover, cultivated floodplains, and isolated settlements and hamlets, linked by the clear, free-flowing river. Certain elements of the landscape are of particular significance because of their role in defining the river and valley environments. The land along the banks of the Delaware forms the immediate environment of the river and helps to define its character: whether wooded embankment or floodplain, settled or farmed. The steeply sloping hills act as valley walls, defining the form of the valley, while ridgelines, found primarily along the corridor's boundary, visually define the valley's edge. (Ridgelines are defined in the Land Use Guidelines as the boundary between the side slopes of the river valley and the adjacent plateau, which often takes the form of "a broad precipice or cliff face.")

The primary impacts to the river corridor's scenic resources are caused by new residential, commercial or industrial development. The proposed plan and Land Use Guidelines would function to prevent or minimize these potential impacts. For the purpose of this analysis, impacts of new development on scenic resources will be assessed by examining the geographic features discussed above, referred to here as "sensitive areas." These are: 1) land within 100 feet of the river's mean high water line; 2) land areas with slopes of 15% or greater; and 3) ridgelines.

In an attempt to analyze past trends, development in the sensitive areas over a fifteen year period (1968-1983) was revealed through examination of USGS quadrangle maps and aerial photographs. Overall, 654 new structures were built within the proposed boundaries of the river corridor, representing a 36% increase over 15 years. Of these new structures; 49% were built in sensitive areas: 35% on steep slopes, 8% within 100 feet of the river; and 6% in ridgeline areas (delineated in general terms on topographic maps). While future development may not occur to the same degree in each of these areas, the data indicate the potential for continued impacts to scenic resource.

Changes in local zoning ordinances in conformance with the proposed Land Use Guidelines would affect scenic resources by limiting the adverse impacts of new development, particularly on riverbanks, steep slopes, and ridgelines. In addition, the effects of the proposed action on the scenic resources of the entire corridor can be analyzed in more general terms.

Impacts on Scenic Quality of Riverbanks

The land area within 100 feet of the mean high water line constitutes approximately 1,800 acres, or 3% of the proposed corridor. It can also be defined in linear terms, as about 147 miles of riverbank (including both sides of the river). Under the proposed action, it is assumed that 12 of the 15 towns would likely adopt zoning measures designed to control development within a 100 foot setback from the mean high water line. This action would provide increased protection of the scenic resources of about 120 river miles (out of a total of 147) from visual intrusions caused by new residential and commercial structures.

Impacts on Scenic Quality of Steep Slopes

Slopes greater than 15% in grade constitute approximately 26,700 acres, or 45% of the proposed corridor's land area. Under this alternative, it is assumed that 12 out of the 15 towns would likely adopt zoning measures requiring conditional use review and/or a professional engineer's plan for proposed structures on slopes of 15% or greater. Although the effects of this action would be dependent on review criteria established by each town it can be assumed that new development would be reduced on steep slopes in about 85% of the corridor (or an area comprising about 80% of the total 26,700 acres of steep slopes within the corridor).

Impacts on Scenic Quality of Ridgelines

Ridgelines define the visual boundary of the river valley, and structures that intrude upon or visually break the natural ridgeline can have a major impact on the landscape. Under the proposed action, it is assumed that 12 out of 15 towns would likely adopt zoning measures requiring that no buildings are located so close to the ridgeline as to exceed the height of the treeline when viewed from the river. The actual miles of ridgeline in the corridor is not known (because ridgelines are topographic features that would require extensive field surveys to accurately identify). However, it can be expected that future total ridgeline development may be reduced or altered in size or location to minimize visual intrusion in about 85% of the corridor.

Corridor-wide Impacts on Scenic Quality

Certain actions proposed in the Land Use Guidelines under this alternative are corridor-wide in scope, and impact the overall scenic quality of the river valley. While the scenic resources affected are not as well-defined as the sensitive areas assessed above, they include forest vegetation, and the village settlement pattern of small residential, commercial and community structures. It is assumed for the purposes of this analysis that 12 out of the 15 towns would be likely to incorporate the actions recommended in the Land Use Guidelines into their zoning ordinances, thus affecting about 85% of the river corridor. These actions are described below.

1. Adoption of the Land Use Guidelines would generally result in limitation of maximum lot coverage to 10% of a site. This would minimize the visual impact of new construction on forest vegetation. Approximately 73% (41,500 acres) of the corridor is forested.

2. Clear-cuts over two acres in size would be barred, also helping to retain natural vegetation in the corridor and maintain the pattern of forested side slopes throughout the valley.

3. The Land Use Guidelines call for restriction of the height of principal structures to 35 feet. This action would limit the visibility of structures in much of the corridor by maintaining them at a height generally below tree level, and would ensure that the height of new structures would be compatible with the character of the area.

4. The Land Use Guidelines call for limitation of number and size of off-premises advertising signs. Uncontrolled signage may degrade the overall scenic quality of the landscape through the addition of incongruous elements and blockage of scenic views.

5. The adoption of housing density limits called for in the Land Use Guidelines, (a maximum density of 1 unit per 2 acres outside of hamlets), would help to retain the existing pattern of low-density development.

6. The prohibition of certain incompatible land uses called for in the Land Use Guidelines (see Chapter II/B) would reduce potential major impacts to scenic resources. Land uses such as junkyards, heavy industry, landfills and major power lines are uncharacteristic of the Upper Delaware landscape.

Conclusion

Scenic resources would be maintained both in sensitive areas and corridor-wide, in about 85% of the corridor.

5. Impacts on Recreation

Introduction

A program for recreation management has been developed as part of the proposed plan and Water Use Guidelines. The intent of the program is to provide facilities which meet basic needs and to manage existing river uses and activities to provide high-quality recreational opportunities.

Recreation management focuses on water related activities during the peak season of May (Memorial Day) to September (Labor Day). Because so much of the corridor consists of private land, land-based activities are managed primarily by private landowners and businesses. NPS jurisdiction is limited to activities in and on the water. Boating, fishing and swimming are the primary water-based activities. Most of the visitors who come to canoe or fish stay for more than one day (Conference of Upper Delaware Townships, 1984) and 60% of the visitors camp near the river (Dawson, et al, 1981) making camping an important activity as well.

Under this alternative, overall carrying capacity, or limits on levels of recreational use, would not be set at this time. Carrying capacity is basically the amount of use an area can sustain while maintaining both environmental and social quality. Under the provisions of this plan, recreation use would be comprehensively studied over the next few years. Appropriate levels of recreation use would not be determined until this study is complete. Additional monitoring of river use is also envisioned. Establishment of the Management Council would provide the forum for future decision-making.

The Water Use Guidelines and recreational management actions proposed in the RMP were based on the analysis conducted by a committee representing a variety of interests and expertise during the development of the River Management Plan. The committee, led by a consultant, used the results of three 1984 surveys of users, livery operators and landowners, and available data regarding existing facilities, to develop a localized set of river facility guidelines. The guidelines focuses on facility typed and distribution, because these were found to be a greater problem than facility size or capacity. In addition to facility development, improved education and enforcement programs were identified as additional measures needed to alleviate recreation-related problems.

The facility guidelines (RMP, pp.84-88) can be summariezed as follows:

> 1 public access area (an area 5-7 acres in size which includes a parking lot, comfort station, phone, map, trash containers, boat launch, and limited picnicking) every 8-11 miles.
>
> 1 river rest stop (an area about 3 acres in size and reached by watercraft which includes a map, trash container and comfort station) every 4-6 miles. NOTE: public access areas also serve as river rest stops.

4 fishing access points (small, preferably leased 2 acre sites, with limited off-road parking and easy shoreline access) specifically in the areas of Knight's Eddy and Pond Eddy in Westfall and Handsome Eddy and below Cedar Rapids in Shohola.

Swimming facility guidelines were not proposed because many felt that swimming was incidental to other activities. As encouraged in the RMP, camping facilities and boat liveries would be provided by the private sector in accordance with local regulations.

There are eight existing public river access sites in the river corridor. These sites already meet the public river access guidelines of one every 8-11 miles.

The addition of the three proposed river rest stops (along with the 8 public river access sites) would provide a rest stop every 6-7 miles, slightly less than recommended in the facility guidelines. However, the 3 proposed river rest stops would be located in the more heavily canoed sections of the river, between Narrowsburg and Port Jervis. According to the New York Department of Environmental Conservation, 62% of the canoe trips in 1972-82 took place between these points. In this section, the additional river rest stops and the existing public access sites would meet the proposed facility guidelines.

Facility Development

In order to estimate whether the existing and proposed facilities will meet future projected recreational needs, this analysis focuses on the three major categories of facility need:

1. Canoe Access Areas
2. Fishing Access Areas
3. Campgrounds

1) Canoe Access Areas

Canoeing is the major river recreation activity. Between 1980 and 1985 an average of 67% of the visitors to the area canoed, and it is expected that this percentage will continue in the future.

The proposed plan does not recommend development of any additional public access sites beyond the 8 existing sites (see Map 3). In addition, the RMP does not recommend the development of any additional privately owned and operated access sites. There are currently 28 such sites owned by commercial canoe livery operators. No data is available regarding levels of use at these access sites.

A 1979 survey (Dawson et al, 1981) found that 90% of the craft on the river were commercially owned, while the other 10% were individually owned. In 1984 the Urban Research and Development Corporation (consultants to COUP) estimated that 13% of all canoeists used their own craft. Based on these figures, which appear to show an increase in use of privately owned craft, it is assumed that over the course of the planning period, roughly 15% of all canoeists will use thier own craft and further, that most of these people would use public access sites. In actuality, a small percentage (which is not known) of individual canoe owners will not use public acccess sites.

The following figures represent estimated past and future use trends.

Year	Estimated # of canoeists (67% of total visitation)	Estimated # of canoeists using their own craft and using public access sites
1983	151,194	22,679
1985	103,290	15,494
1990	130,851	19,628
2005	189,543	27,831

(Total visitation figures are outlined in Appendix C.)

The capacity of public access sites is limited primarily by the number of parking spaces they provide. Canoeists generally park for most of the day, since canoe trips average about 6 hours in length. Facility needs are most critical during peak use days, which occur on summer weekends. It can be roughly estimated, based on visitor use statistics, that a peak use day represents approximately 3% of total annual use. Assuming that this percentage will remain constant the number of canoeists using public access sites on a peak use day can be estimated as follows:

Year	Estimated # of canoeist using public accesses and their own craft	Estimated # of canoeists with their own craft using public accesses on a peak day
1983	22,679	680
1985	15,494	465
1990	19,628	589
2005	27,831	835

The total maximum daily capacity of the eight public access sites is estimated as follows:

Site	# of Parking spaces
1. Lackawaxen, PA	81
2. Narrowsburg, NY	64
3. Skinners Falls, Cochecton, NY	52
4. Damascus, PA	23
5. Callicoon, NY	45
6. Callicoon, PA	20
7. Buckingham, PA	18
8. Narrowsburg, NY	12
Total	315

Maximum daily capacity can be estimated on the basis of number of parking spaces, multiplied by 3 which represents the average number of persons per car and multiplied by 1.5 which represents the number of times a parking space can be used per day. Based on these estimates, maximum capacity at the 8 existing sites is approximately 1418 people. As can be seen, this figure is well in excess of the projected peak day access needs for the year 2005 (835 canoeists).

2) Fishing Access Areas

Anglers gain access to the river at public access sites and on private lands, by permission from landowners. Anglers fish from the shorelines, wade in the river and fish from boats. Most anglers fishing for trout or bass can be found on the river during the early morning and evening hours during the spring, summer, and fall. Shad fishing occurs all day during the annual spring migration.

NPS statistics show that fishing accounted for about 6% of the total visitation between 1980-1985. NY Department of Environmental Conservation statistics show an increase in fishing between 1978 and 1982 and both Pennsylvania and New York Statewide Comprehensive Outdoor Recreation Plans project about a 20% increase in fishing over the next 20 years. For the purpose of this analysis, it is assumed that fishing would account for 10% of total annual future use in the area. Based on overall visitation projections, the trend in fishing is estimated as follows:

Year	Total projected visitation	estimated # of anglers
1983*	225,959	9141
1985*	157,711	10,910
1990	195,300	19,530
2005	282,900	28,290

*based on actual visitation

As with the analysis of canoe use, it is assumed that a peak fishing day will account for 3% of total annual fishing, as follows:

Year	Estimated # of anglers/year	Estimated # of anglers on a peak use day
1983	9141	274
1985	10910	327
1990	19530	585
2005	28290	849

According to NY Department of Environmental Conservation estimates the distribution of the anglers would be as follows:

Location	% of anglers	# of public access sites
Hancock to Callicoon	25	3
Callicoon to Narrowsburg	13	4
Narrowsburg to Port Jervis	63	1

Source: NY DEC Technical Report 83-5 (1983)

It is difficult to assess the capability of existing and proposed facilities to accommodate anglers because of the variety of access approaches used by anglers and because there is no data on the number of anglers using public access sites. For these reasons, no attempt was made to quantitatively assess the ability of access sites to meet future needs. An examination of the trends shows that although most of the fishing takes place in the southern section of the river, the fewest public access points are currently available in that section. It appears that the public access facilities south of Narrowsburg are inadequate for fishing by comparison to the other areas.

The proposed RMP recommends that four fishing access sites be developed in this area. With the development of these access sites, it appears that facilities would be more evenly distributed and would help meet angler needs in the most heavily used area of the corridor.

3) Campgrounds

As noted, approximately 60% of all visitors to the Upper Delaware camp overnight. Camping facilities are provided almost exclusively by the private sector. In 1985, 26 campgrounds, having an average of 92 sites per campground, were in operation. Based on actual and projected visitation figures, the following represents the number of overnight campers:

Year	Estimated # of visitors	Estimated # of visitors camping
1983*	225,959	135,575
1985*	157,711	94,627
1990	195,300	117,180
2005	282,900	169,740

*actual visitation

As with canoe access needs, campground facility needs are most critical during peak use days which occur on summer weekends. Based on visitation statistics, a peak use day represents approximately 3% of total annual use. Using this percentage, the number of campers on a peak use day can be estimated as follows:

Year	Estimated # of campers	Estimated # of campers on a peak day
1983	135,575	4067
1985	94,627	2839
1990	117,180	3515
2005	169,740	5092

To roughly determine the number of camping facilities needed to meet peak requirements, the projected number of campers can be compared to the projected number of available campsites. Based on an average of 3 campers per campsite, the maximum daily capacity of an average campground can be estimated at 276 people (3 X 92 sites).

Year	Estimated # of campers on a peak day	Estimated # of campsites needed	Estimated # of campgrounds needed
1983	4067	1356	5
1985	2839	946	3.4
1990	3515	1172	4.25
2005	5092	1697	6.15

The above analysis indicates that existing campgrounds would be able to accommodate projected levels of future use.

Quality of Experience

The 1984 recreational user survey (conducted by the Conference of Upper Delaware Townships) found that the river corridor's landscape and water quality were the key characteristics that made the recreation experience a pleasant one. The proposed Land Use Guidelines have provisions aimed at conserving these qualities through local government land use controls (see Section 4 of this Chapter).

The additional river rest areas proposed in the RMP would address a major problem noted by users; lack of river facilities. The quality of the recreation experience would be enhanced by the provision of these facilities, particularly in the more heavily used section below Callicoon.

Users also noted the need for information and directional signs and improved safety. The proposed plan calls for development of a visitor contact facility near the Mongaup River. A 1981 Cornell University study (Dawson et al, 1981) found that nearly 60% of non-resident recreational users did not plan their trip or planned only in a general way before coming to the river area. Nearly one third of survey respondents found tourist and recreation information to be inadequate. Development of the Mongaup visitor center at a major southern approach to the river area would meet the information needs of a significant percentage of non-resident recreational users, and is projected to increase the existing level of visitor contacts by 40%. The proposed interpretation program associated with the Delaware & Hudson Canal and other aspects of the river and its historic uses, would enhance visitor awareness of the natural and cultural resources of the Upper Delaware.

The existing licensing program for commercial liveries would be continued and expanded to include recreational camps which use the river. Approximately 85% of the total number of recreational boaters obtain watercraft for use on the Upper Delaware through commercial boating liveries. Another 5% of boaters obtain watercraft through the recreational camps. Continuation and expansion of this program would ensure that safety standards would be enforced and that information on boating techniques and conditions would be provided to nearly all recreational boaters.

River patrols would be increased by 30% during peak periods through cooperative efforts with local and state governments and law enforcement organizations. Expanded patrols and stricter enforcement would also decrease the amount of trespassing on private lands. Expanded river patrols would allow more opportunity to provide information to users on proper boating techniques, resulting in safer boating conditions.

Conclusion

The proposed public facilities will adequately meet present and future needs, while the private sector will continue its major role as a recreation provider. The quality of the recreation experience will be maintained or enhanced under this alternative.

6. Impacts on Historic and Archeological Resources

Introduction

Prehistoric and historic archeological sites, and historic buildings, sites and structures, constitute the major types of cultural resources in the

Upper Delaware area. Historic and archeological resources in the river corridor have not been fully surveyed and documented. These resources reflect a long history of human occupation and resource use, and are significant not only as individual sites but as part of the area's rural landscape.

Impacts on cultural resources under this alternative range from direct results of NPS management actions to the long-term and indirect results of existing trends toward increased visitation and residential development. To aid in the analysis, the following categories of impacts can be delineated:

Impacts of NPS facility development

The development by NPS of the facilities described in the proposed plan, including a major visitor contact facility, bridge parking areas, and river rest stops, has the potential to alter, damage, or destroy undiscovered surface or subsurface archeological resources. In accordance with NPS standards, all development with potential for ground disturbance would be preceded by an archeological clearance to ensure that there were no significant archeological resources within a project's area of effect, or that if present, such resources would not be adversely impacted. Any significant resources that would be adversely affected would undergo mitigation in accordance with the NPS Cultural Resource Management Guidelines (NPS-28), and in compliance with the Archeological Resource Protection Act of 1979 and the National Historic Preservation Act of 1966.

Impacts of NPS management and interpretation

NPS management actions are identified for a number of sites in the proposed plan (listed in Chapter II/B.1). Actions range from acquisition on a willing seller-willing buyer basis to cooperative agreements for the protection and interpretation of specific sites. Other sites are proposed for management by state, local and private interests. As a result of these actions, the likelihood of protection, stabilization, and restoration of these sites would be enhanced.

The proposed plan calls for coordination between NPS, the Upper Delaware Management Council, and state and local government agencies to provide technical assistance in the protection and interpretation of cultural resources. This type of technical assistance would take the form of landowner contact programs, funding for historic building surveys, education programs, and assistance with nomination of significant properties to the National Register of Historic Places. These actions would have positive impacts on cultural resources by fostering increased government recognition and public awareness of their importance.

Impacts from recreational use

Future recreational use of the river could cause damage to cultural resource sites from vandalism or overuse. The proposed increase in river patrols called for in the proposed plan would help to mitigate this problem, while continued enforcement by local police and constables of ordinances against littering and trespass could lessen the disturbance to resources on private lands.

Impacts from new development

Increased development, both residential and commercial, has the potential to significantly alter, damage or destroy undiscovered archeological resources. This problem would be especially critical on the floodplain terraces along the river, used at present mainly as cropland and pastureland, where archeological resources tend to be most abundant. Conversion of agricultural lands to residential or commercial uses would be allowed to occur under this alternative. Local zoning controls on density and lot coverage in conformance with the Land and Water Use Guidelines would not preclude continued low-density residential and commercial development on agricultural lands and on floodplain terraces. Since no further archeological surveys are proposed for the river corridor, the exact number and location of many archeological sites is likely to remain unknown, but some losses of such sites would likely occur.

Efforts by NPS and state and local agencies to educate landowners about the proper treatment of archeological resources would help to alleviate this problem. Development in floodplain areas would continue to be limited in certain communities through floodplain development ordinances, prepared in compliance with the National Flood Insurance Program. All 15 Upper Delaware communities participate in this federal program, and 8 towns have implemented ordinances restricting or prohibiting new development in the floodplain. These ordinances would limit development only in the designated 100-year floodplain, which does not encompass all of the floodplain terraces where archeological sites are commonly found.

Based on past trends, most new residential development in the river corridor would occur in forested upland areas, where concentrations of archeological resources appear to be rare, according to the Cultural Resource Survey. Service oriented businesses such as motels and related commercial recreational facilities would be an incompatible use in scenic segments and a conditional use in recreational segments. Review of conditional uses by the Upper Delaware Management Council would help to ensure protection of archaeological resources, in areas where the presence of such resources is known.

Another major action that would occur under this alternative is the prohibition of new incompatible land and water uses (identified in Chapter II.B) within the river corridor. Most potential incompatible uses would involve major ground disturbances that could disturb historic and archeological sites. Under this alternative it is assumed that 12 of the

15 Upper Delaware towns, encompassing about 85% of the corridor, would be expected to enact local ordinances prohibiting these incompatible uses.

Conclusion

The prohibition of incompatible uses in about 85% of the corridor would remove a potential source of major disturbances to archeological and historic resources. There would be positive effects on historic and archeological resources from cooperative management of identified sites and from public education and interpretation programs. Significant archeological sites throughout the entire river corridor may suffer localized adverse effects from new residential or commercial development, especially on floodplain terraces.

7. Impacts on Landowners

Introduction

The 1984 Upper Delaware Landowner Survey found that most landowners were concerned with the potential interference with the use of their property. The riparian landowners were particularly concerned with "Acquisition of Land" (46%) while the non-riparian owners saw "Regulations on Use" (37%) as the major threat. When asked to rank the seriousness of selected problems, the landowners perceived littering (44%) to be a more serious problem than trespassing (29%), vandalism (25%), or over-crowding (18%).

Impacts from Land Use Regulations and Acquisition

1. Interference with Use of Private Property

In the Upper Delaware river corridor, land use is managed at the local level; decisions regarding land uses and their control are made on a town by town basis. Eleven out of fifteen towns presently have zoning ordinances; the other towns have some type of permit system, regulation, or subdivision code which affects land uses (see Appendix D). Under the proposed plan, each town would be asked to conform with the River

Management Plan and Land and Water Use Guidelines. For purposes of analysis, it is assumed that over the course of the planning period, 12 of the 15 towns would do so.

Decisions regarding land use would continue to be the responsibility of local governments. The Management Council, however, would review existing ordinances to determine whether they substantially conformed to the RMP and the Land and Water Use Guidelines. Local governments would have at least a two year period within which they could modify or adopt zoning ordinances to achieve conformance. While conformance is not mandated by the Upper Delaware legislation, failure to conform means that condemnation can be used within the non-conforming town as a last resort, if necessary, to block a clear and direct threat to the resource protection objectives of the federal legislation.

The conformance process set out in the legislation, and amplified in the proposed RMP and Guidelines, would likely result in some additional local regulation and in the modification of some existing local regulations. It is not expected that any of the changes necessary to conform to the Guidelines would interfere with most landowners' ability to develop their property in a manner consistent with the existing development pattern in the area.

Prohibition of the uses listed as "incompatible" in the Guidelines could affect the ability of a few landowners to develop their land for certain uses. However, most landowners should be positively affected by the prohibition of the listed incompatible uses since potential deleterious adjacent or nearby land uses (such as landfills or junkyards) would be prevented.

2. Acquisition of Land

The proposed plan calls for approximately 130 acres to be acquired by NPS on a willing seller basis. There are no plans for large scale federal acquisition of land. This represents well under 1% of the corridor's total acreage. The acquisition of any additional land through condemnation would likely be minimal. As described in Chapter II, the proposed RMP contains several provisions limiting the use of condemnation and seeking to ensure that it is available only as a last resort measure within nonconforming towns.

Impacts from Littering and Trespassing

The survey of landowners (COUP, 1984) found that litter was a major concern, with 44% of landowners noting it as a problem. The litter problem is perceived as being primarily visitor or recreational user related. However, there have been occurrences of dumping and careless disposal of trash which contribute to the problem.

Local law enforcement statistics indicate that trespass incidents occurred more frequently as use levels increased. It follows that as future use increases, so will trespass problems. Since NPS has no jurisdiction on private lands, there are no violation notices served by NPS rangers on private land and all trespass problems are dealt with locally.

The proposed plan recommends several measures to minimize litter and trespass problems. Educational programs by the Management Council, NPS, and river-related businesses would inform river users of a carry in/carry out policy and build awareness about littering and trespass. Increasing river patrols by 30% during peak use periods through federal, state and local cooperation would result in greater detection of these acts. A centralized NPS phone system will make it easier for landowners and others to report incidents. In addition, improved radio communication would enable appropriate local, state and NPS law enforcement personnel to look into reported problems and respond more quickly. Voluntary clean-ups sponsored by area business and private organizations would also help reduce the amount of litter found along the riverbanks. The stricter enforcement of existing laws would likely deter violation, particularly because 73% of river users at present are repeat visitors. The provision of additional facilities would also contribute towards minimizing trespass and litter on private property by drawing users away from private lands and providing receptacles for trash.

Conclusion

The proposed plan would result in changes to existing local land use regulations, either through adoption of new ordinances or modification of existing ones. Some landowners could be affected by new local regulations, especially if they were contemplating a use listed as "incompatible" in the Land Use Guidelines. There would be a negligible effect on landowners due to federal land acquisition, because of the small acreage involved.

Increased public educational programs and river patrols, combined with improved communication, would result in improved law enforcement and a decrease in littering. Impacts on landowners from these problems would be lessened.

8. Economic Impacts

Impacts on Land Values

Coughlin, Keene, and Associates determined in their 1985 study (see Chapter III/G.7) that implementation of the proposed plan would not affect land values within the river corridor. The study identified these preference patterns among actual and potential purchasers of land in the Upper Delaware River corridor:

purchasers of second homes - 3 or more acres
purchasers of year round homes - 2-5 acres

These preference patterns indicate that implementation of the proposed RMP and Guidelines (particularly the 2 acre minimum lot size standard contained in the Guidelines) would not materially interfere with the buyers' market, since most purchasers show a preference for lots greater than 2 acres in size.

Coughlin and Keene's analysis does suggest that knowledge of future implementation of the RMP has resulted in, and may continue to result in, an increase in land prices and in the amount of money that purchasers are willing to pay for available land. The assumption underlying this conclusion is that increased scarcity of land and increased environmental protection results in increased competition for available land, which drives prices higher. Coughlin and Keene concluded that this phenomenon would affect the buyers' and sellers' market as follows:

> Buyers would be willing to pay higher prices for land:
>
> (1) because of assurance that environmental quality would be maintained.
>
> (2) since no new smaller lots would be created, competition among purchasers for these smaller lots would increase.
>
> Sellers would increase prices of land because:
>
> (1) owners of 5 acre lots would realize that future subdivision was not possible. In order to compensate for potential economic loss, prices would be increased.
>
> (2) owners of lots "grandfathered" at less than 5 acres would realize that they possess a scarce commodity and can command a higher selling price.

It should be noted that Coughlin and Keene's analysis assumed a minimum lot size of 5 acres outside hamlet areas, as was the case in the 1981 Land Use Guidelines. The 1985 Land Use Guidelines call for a minimum lot size of 2 acres outside hamlets. However, the rationale followed by Coughlin and Keene would still appear to hold true, with the exception that less "scarcity" of land would result, since moderately-sized (2-5 acre) lots would still be available under this alternative.

Impacts on Municipal Finances

Under this alternative, the National Park Service would acquire approximately 130 acres of land for construction of facilities and access points. The direct effects of acquisition on municipal finances would be minor for two reasons. First, the amount of land to be purchased is a small percentage of total acreage for each affected township. Second, the tax generating ability of land proposed for acquisition is limited to begin with. The purchase of 70 acres in Deerpark, for example, would include undeveloped acreage owned by a utility, while the 40 acres in Tusten is owned by the Boy Scouts of America and is already tax exempt.

Munley and Aronson's study "The Impact of the River Management Plan on the Finances of Local Governments in New York and Pennsylvania" (1985, River Management Plan Appendix) evaluated the impact of the proposed plan on the local tax base, and the level of municipal expenditures required for various categories of services.

The study made the following assumptions about growth in the river corridor projected over a 10 year period:

A 20% increase in river visits
A 20% increase in second home development
A 5% increase in retirement population

These growth assumptions are important to the analysis because increases in the above categories would either necessitate increases in municipal expenditures on particular services, or generate revenues for municipalities. The 20% increase in river visits is a conservative assumption, but was based on best data available at the time. This trend has been revised upward to 28% (an annual increase of 2.5%) for the purposes of this analysis. This 28% figure is based on more complete

Table IV.1

Effects on Township Expenditures for Alternative I Over a 10 Year Period (Dollar Values in Thousands of Dollars)

		Additional Expenditures Due to An Assumed Increase In:			All Three Factors	
	1982 Total Expenditures	Retirement Population	Recreation Visits	Second Home Ownership	Total	Annual Tax Increase Over 10 Year Period
Hancock	$592.1	$ 27.0	$ 12.5	$ [.9]	$ 38.6	.57%
Deerpark	716.8	33.0	10.1	8.7	51.8	.77%
Cochecton	423.6	18.9	8.8	[5.4]	22.3	.52%
Delaware	524.2	23.5	10.9	[.9	33.5	.37%
Fremont	337.0	17.6	8.5	7.4	33.5	.92%
Highland	512.6	17.8	9.0	[11.8]	15.0	.33%
Lumberland	533.8	20.0	10.5	[12.3]	18.2	.34%
Tusten	482.3	14.8	7.1	[3.5]	18.4	.29%
Lackawaxen	229.2	9.2	2.8	[4.0]	8.0	.30%
Shohola	140.4	5.7	2.2	[3.6]	4.3	.26%
Westfall	206.7	2.8	1.1	[.6]	3.3	.16%
Berlin	156.5	5.3	3.1	1.4	9.8	.63%
Buckingham	95.7	3.2	1.5	1.4	6.1	.58%
Damascus	397.9	16.7	9.4	7.7	33.8	.85%
Manchester	176.5	6.8	3.2	2.9	12.9	.69%

Assumptions: 28% growth in visitation
20% growth in second home ownership
5% growth in retirement population

Brackets indicate negative numbers

Source: Based on Munley and Aronson, 1985 (Appendix, River Management Plan) visitation data (discussed in Appendix C). It should also be noted that Munley and Aronson used a 10 year period for their projections, while the River Management Plan, and this DEIS, use a 20 year planning period.

According to Munley and Aronson, existing trends of increases in river visits, vacation homes, and retirement population were found to increase the level of spending on highways. Increases in retirement populations will cause higher levels of spending for government administration, fire protection and sanitation. However, these expenditures will be balanced in most cases by additional tax revenues accruing to towns and townships from increases in second homes.

The National Park Service and the state governments would bear the additional costs of revising local land use plans and ordinances to be consistent with the Land and Water Use Guidelines. Financial assistance provided to the river towns and townships would largely offset the costs of preparing or revising local plans and ordinances. This financial assistance would be provided based on the availability of federal funding.

Conclusion

Implementation of the proposed RMP would have little effect on the land market, since minimum lot size of 2 acres outside hamlets would be in accord with the preferences of most potential buyers.

Costs to municipal governments for preparing or revising local ordinances implementing the Land Use Guidelines would be minimal in most cases, assuming the continued availability of federal financial assistance for such purposes.

D. Alternative 2: No Action, or Continuation of Interim Management

1. Impacts on Fisheries

Impacts from New Residential Development

Local land use provisions controlling development within 100 feet of the river would likely be in effect in about one-third of the 1978 corridor, as would provisions regulating construction on slopes greater than 15% in grade. Earthmoving activities associated with new residential and commercial development on the Pennsylvania side of the river corridor would be required under state law to have a soil erosion and sedimentation control plan.

The projected 25% increase in residential structures over the next 20 years would continue to be primarily vacation homes constructed on lots 2 acres in size or more. The dispersed nature of this development would help to minimize any adverse impacts resulting from soil erosion and sedimentation. However, scattered erosion problems could occur on a few tributary streams within the corridor, resulting in minor losses of trout fisheries spawning and nursery habitat.

Impacts from Incompatible Uses

As under Alternative 1, the Wild and Scenic Rivers Act would preclude federally licensed water resource projects, such as impoundments and channel modifications. New major mining operations (such as sand and gravel mining operations greater than 2 acres in size) would be precluded by local zoning in about half of the river corridor; major mining operations in the remainder of the corridor would still be subject to state mining and reclamation regulations.

Because of existing market conditions, many other incompatible land uses with potentially adverse effects to fisheries would not likely be developed within the next 20 years, including heavy industrial uses, major airports and marinas. However, 35% of the corridor would be available for such uses, should they occur.

Conclusion

The overall quality of the river's fisheries would be maintained; however, incompatible uses which may affect fisheries could occur in up to 35% of the corridor. Minor losses of trout fisheries habitat may occur on several river tributaries caused by temporary localized soil erosion problems from new residential development.

2. Impacts on Water Quality

Impacts from New Residential Development

Local zoning measures requiring 2 acre minimum lot sizes for new residential development would likely be in effect in about two-thirds of the 1978 corridor. The remainder of the corridor would be subject to higher density development. As discussed under Alternative 1, low density residential development (in the amounts projected) would not be expected to have adverse impacts on water quality. In addition, all new residential development relying on septic disposal systems would be required to have a soil percolation test by a state or local enforcement official. The scattered character of residential development and the use of soil percolation testing for new development should result in only minor increases in nutrient and bacteria levels in a few Upper Delaware tributaries.

Impacts from Incompatible Uses

About two-thirds of the river corridor would be covered by zoning ordinances precluding incompatible uses which could have potentially significant effects on water quality. Such uses would include landfills, junkyards, and heavy industry. Within the remainder of the corridor, condemnation could be used as a last resort to block a proposed incompatible use in a town not in conformance with the Land Use Guidelines.

Conclusion

Water quality would be maintained in most of the corridor through local and state regulations limiting new septic disposal systems and major incompatible land uses. Minor increases in nutrient and bacteria levels may occur in several river tributaries from new residential development under this alternative.

3. Impacts on Important Species

Impacts from New Development

As under Alternative 1, local zoning measures would serve to mitigate adverse impacts from new development on important species. Such measures would include prohibition of new structures within 100 feet of the mean high water mark; limitations on development within the floodplain; and conditional use review of new construction on slopes of 15% or greater in grade. Five of the fifteen towns within the river corridor would prohibit new structures from being built within 100 feet of the river, and would require site plan review of building on slopes over 15%. As a result, about 35% of the river corridor would be protected from potential loss of important habitat due to new development.

Impacts from Recreational Facilities and Use

Under the no action alternative, no new public recreational, visitor or interpretive facilities would likely be developed. Because additional public river rest areas and river access sites would not be developed under this alternative, increased unauthorized use of the floodplain and islands could occur. Although NPS is presently conducting a study to determine the impacts of recreation use on the environment, it is expected that potential loss of river related species such as the Great St. John's Wort, sand cherry and river birch would result.

Conclusion

About 35% of the corridor would be protected from potential loss or damage of important species habitat through new development and recreational use of the river corridor.

4. Impacts on Scenic Resources

Under the no action alternative current trends in development would continue. Local land use controls through zoning ordinances (which in some cases adhere to the principles of the Guidelines) would continue. However, no major changes in current zoning are foreseeable at this time. Land use controls would affect scenic resources in the 1978 river corridor as follows:

Impacts on Scenic Quality of Riverbanks

Five of the 15 towns would continue to require a 100 foot setback for structures from the mean high water line. This requirement would contribute to the maintenance of an undeveloped, natural river setting in streambank areas of these towns, a distance of approximately 54 river miles (out of a total of about 147 river miles). Riverbank development could occur in the remainder of the corridor, subject to federal, state and county regulations.

Impacts on Scenic Quality of Steep Slopes

Five of the 15 towns (encompassing about 35% of the corridor) would continue to require conditional use review and/or a professional engineer's plan for development on slopes of 15% or greater. While the precise effects of these requirements would be dependent on the review criteria established by each town, these criteria would generally serve to minimize the adverse impacts of steep slope development in those towns.

Impacts on Scenic Quality of Ridgelines

Three of the 15 towns would continue to require that no buildings be located along the ridgeline or where they would create a silhouette or cantilever effect. Ridgeline development in these towns would likely be reduced or altered in location to meet this requirement, affecting ridgelines in about 20% of the corridor.

Corridor-wide Impacts on Scenic Quality

Seven of the 15 towns, encompassing 50% of the corridor, would continue to limit lot coverage to no more than 10% of the site. This may affect scenic resources indirectly by limiting the extent of building coverage and thus building size and the extent of visual impact on natural cover.

Four of the 15 towns would likely continue to prohibit clearcutting; two other towns would permit clearcutting only by special permit. These 6 towns constitute about 30% of the corridor. Eight of the 15 towns (encompassing 55% of the corridor) would continue to restrict the height of principal structures to 35 feet. These regulations would limit the visibility of structures corridor-wide by maintaining them at a height generally below tree level, and helping ensure that structures are compatible with the valley's existing character.

Four towns would continue to prohibit off-premises advertising in river corridor areas, while three others would limit the size, number, type or location of permissible off-premises advertising signs. Overall, signs would be regulated in 7 towns, or about 40% of the river corridor. Uncontrolled signage could degrade the overall landscape through the addition of incongruous elements and the blockage of scenic views.

Nine towns (representing 60% of the river corridor) would continue to limit housing density to an maximum of 1 unit per 2 acres. In these towns, this requirement would reduce scenic impacts of development by preventing high density developments uncharacteristic of the river corridor.

Approximately 65% of the towns would limit land and water development for various land uses identified as incompatible in the revised Land and Water Use Guidelines (see Chapter II/B.) which may impact scenic resources. Where a proposed incompatible use is not controlled by town ordinances and presents a clear and direct threat to scenic resources, the Secretary of the Interior could, if necessary, initiate steps to acquire the site.

Conclusion

Town regulations would provide varying degrees of protection of the river corridor's scenic attributes through clearcutting limitations, height restrictions, limitations on off-premise advertising, maximum density standards, and the prohibition of certain land uses. Between 35% and 60% of the corridor would be protected under the various regulations. Some loss of scenic quality would be expected to occur in the remaining areas, through uncontrolled signage, new development out of keeping with the character of the area, and possibly, through development of major incompatible land uses.

5. Impacts on Recreation

As in Alternative 1, no immediate actions would be taken to limit recreational use on the river. However, the recreation use study underway will provide information for making these management decisions in the future. Without a management council, these decisions would be made exclusively by the National Park Service. In addition, no new public facilities would be developed to accommodate existing or future use.

Facilities

The existing public river access facilities could accommodate projected use as the analysis in Alternative 1 indicates. If recreational use posed a threat to public safety or health in the future, measures to limit use would be put into effect.

No additional public river rest areas would be developed. This would continue to make user experiences unpleasant in terms of number of rest areas, comfort stations, and trash containers. Problems such as trespass and litter would continue at existing or higher levels due to the lack of facilities. The problems would be particularly noticeable south of Callicoon, in the more heavily used section of the river.

The private sector would be expected to provide any needed new facilities for canoeing and camping. Market forces and local government regulation would determine the number and location of these facilities. Based on the analysis conducted in Alternative 1, the private sector would be able to accommodate the increased canoeing and camping use which is projected for 2005. Public fishing access would continue to be inadequate in the section between Narrowsburg and Port Jervis.

Quality of Experience

Scenery is a major characteristic which river users enjoy. Impacts of the no action alternative on scenic resources were assessed in Section 4 of this Chapater.

Information and education programs would continue at present levels. While it is expected that additional efforts would be made to educate users, in the absence of a visitor contact facility, increased river patrols, and a coordinated information and sign program, only a small increase could be expected in visitor contacts. Information and directional needs would continue to be of concern to visitors.

Conclusion

Public access facilities would accommodate projected use, however, the lack of river stops and fishing access would continue to be a problem. The private sector would be expected to meet camping and canoeing needs. The quality of the experience would be expected to diminish due to some loss of scenic resources and a lack of adequate information programs.

6. Impacts on Historic and Archeological Resources

Impacts of NPS facility development

Any facility development by NPS under this alternative would be minimal, consisting only of improvements to the NPS headquarters in Damascus and development of parking areas at the Delaware Aqueduct (Roebling Bridge). As under Alternative I, NPS procedures for archeological clearances and mitigation would apply to any such facilities.

Impacts of NPS management and interpretation activities

Under this alternative NPS would continue to manage and interpret only those historic resource sites that are currently under NPS management. Restoration and re-opening of the Delaware Aqueduct to light vehicular traffic would be completed as planned, and NPS would continue to lease space in the Old Arlington Hotel and the Zane Grey House. NPS and the State Historic Preservation Offices of New York and Pennsylvania would continue to assist private landowners with nominations to the National Register of Historic Places if requested to do so, but NPS would not initiate any public education or interpretation programs.

The protection and interpretation of cultural resources through state and local programs would continue, but without coordination by the Upper Delaware Management Council. The services of the State Historic Preservation Offices of Pennsylvania and New York would continue to be made available. The sites proposed for voluntary agreements or acquisition by NPS under the proposed plan (listed in Chapter II/B.1.) would not receive such protection. As a result, the probability of achieving long term protection for these sites would be decreased.

Impacts from Recreational Use

Recreational use of the river corridor can adversely affect historic and archeological resources through vandalism or overuse. Under this alternative the increases in river patrols called for under the proposed action would not occur. Instead, river patrols would be continued at their present level, so that the level of protection afforded historic and archeological resource sites from the impacts of recreational use would not be increased.

Impacts from New Development

Impacts of increased residential and commercial development in sensitive archeological areas would potentially be more severe than under the proposed action. Nine towns would likely impose a minimum lot size of one unit per two acres, limiting development in about 65% of the river corridor. Local river protection zones with setback requirements in 5 towns (about 35% of the river corridor), and floodplain protection ordinances in at least 9 towns (about 65% of the corridor) would also limit construction of large numbers of new dwelling units in floodplain terrace areas. Even low density development, however, can still affect archeological sites. Since knowledge of archeological sites is still incomplete, it is impossible to predict how many sites could be disturbed, but it is expected that some losses would occur due to new construction.

Other land uses that could adversely impact cultural resources are those identified in the proposed plan and Land Use Guidelines as "incompatible uses," a category which includes uses such as major transmission lines, major highways, junkyards and other large-scale uses. Under this alternative, it is assumed that approximately 5 of the 15 Upper Delaware municipalities (occupying about 35% of the corridor) would not regulate the majority of such incompatible uses. Since such land uses generally involve extensive ground disturbance, they have great potential for disrupting both historic and prehistoric archeological sites. However, the probability of this type of large-scale construction is far less than the probability of continued residential development in the river corridor. Furthermore, if state or federal funds were involved in any large-scale construction project, potential impacts to cultural resources would be evaluated as part of the required environmental review processes.

Conclusion

Continued residential development in archeologically sensitive areas, and the increased probability of incompatible land uses, may have a negative impact on archeological resources. NPS assistance to landowners, assistance from state agencies, and local resource protection efforts would continue to foster public awareness of historic and archeological resource values.

7. Impacts on Landowners

Impacts from Land Use Regulations and Acquisition

1. Interference with use of private property

Under this alternative, there would be no River Management Plan or Management Council. Eleven of the towns already have zoning, and all the towns have at least have some form of land use control. It is not expected that there would be any major changes in the existing pattern of government regulation of private property.

2. Acquisition of land

Federal acquisition (through purchase or condemnation) would be limited. No acquisition of land for recreational facility development would be expected. While condemnation could occur within towns not in conformance with the Land Use Guidelines (as a last resort measure to block a clear and direct threat to the corridor's resources), such action would be unlikely based on past trends, the lack of a management plan, and the probable difficulty in obtaining appropriations for such purposes.

Impacts from Littering and Trespassing

Efforts to curb littering and trespassing would rely primarily on voluntary clean-up programs, existing patrols, and present communication systems. As under the proposed action, continued local trash and law enforcement assistance would be based on funding availability.

No new public facilities or support facilities such as trash cans or restrooms would be added. Patrols would be maintained at existing levels. While some small reduction of litter and trespass problems would be expected through existing efforts, problems would continue due to expected shortages of public facilities and the increased number of visitors.

Conclusion

Landowners would continue to be subject to local land use regulation with no overall coordination by a Management Council. Federal acquisition would have no effect on most landowners because of the small amount of acreage involved. With continuation of existing levels of enforcement, landowners could expect litter and trespass problems to increase.

8. Economic Impacts

Impacts on Land Values

Zoning regulations requiring a minimum lot size of two acres for land outside of hamlets would continue to be enforced in 9 out of the 15 towns (about 65% of the corridor). Since according to Coughlin and Keene's study, most buyers perfer lots of 2 acres or more in size, such regulations would be expected to have little or no effect on land values.

Impacts on Municipal Finances

Under this alternative, it is projected that the National Park Service would be able to acquire, at most, about 450 acres of land to prevent clear and direct threats to the river's resources. Land acquired would be removed from the tax rolls. However, this would represent a very small percentage of total corridor acreage, so the overall effect on revenue generated from property tax would be minor.

This alternative assumes the same growth trends as does Alternative 1: a 28% increase in river visits, a 20% increase in second home development and a 5% increase in retirement population over a 10 year period. There is no evidence to indicate that any of these trends would be significantly altered under this alternative. Therefore the effects on municipal expenditures are basically the same as those shown in Table IV.1 for Alternative 1.

Conclusion

As under Alternative 1, the impacts of this alternative on the land market would be relatively minor. Impacts on municipal finances would be largely the same as under the proposed action.

E. Alternative 3: Implement Modified River Management Plan

1. Impacts on Fisheries

Impacts from New Residential Development

Local land use provisions regulating new construction on slopes over 15% in grade and controlling new construction within 100 feet of the river would be in effect in about 75% of the river corridor. Scattered erosion problems associated with new construction could be expected in the 25% of the corridor not covered by such zoning controls. Minor losses of trout spawning and nursery habitat on a small number of river tributaries might result.

Impacts from Incompatible Uses

As under the other alternatives, the Wild and Scenic Rivers Act would preclude federally licensed water projects, such as impoundments and channel modifications.

Proposed new major mining operations, and heavy industrial uses would be prohibited by local zoning in about 80% of the river corridor. If proposed elsewhere in the corridor (that is, within towns not in conformance with the Land Use Guidelines) condemnation could be used as a last resort measure.

Conclusion

Fisheries habitats would be maintained through the requirements of Section 7 of the Wild and Scenic Rivers Act, limits on development of incompatible uses and local land use controls consistent with the Land Use Guidelines. Minor losses of trout habitat on a few river tributaries may occur from residential construction activities.

2. Impacts on Water Quality

Impacts from New Residential Development

Under this alternative, it is projected that towns in about 75% of the river corridor would adopt local zoning in conformance with the Land Use Guidelines' standard that residential lots outside of hamlets be a minimum of 2 acres in size. Higher density residential development would be allowed to occur within hamlet areas and in the remaining 25% of the corridor. Continuation of trends in the existing real estate market, with most new residential development occurring on lots of 2 acres or more, scattered throughout the corridor, would minimize the effects of septic discharges on surface and groundwater quality. All new residential development relying on septic disposal systems would be required to have a soil percolation test by a state or local enforcement official. The scattered character of residential development and use of soil percolation testing should result in only minor increases in nutrients and bacteria levels in a few Upper Delaware River tributaries.

Impacts from Incompatible Uses

About eighty percent of the river corridor would be subject to local zoning provisions prohibiting incompatible uses which could have potentially significant adverse impacts on water quality. These uses would include heavy industry, landfills and junkyards. Within the remainder of the corridor, condemnation would be available as a last resort measure to prevent a proposed incompatible use.

Impacts from Recreational Facilities Development and Use

Development of new public recreational facilities may result in minor effects on surface water quality. Some sediment loading may occur during construction of three river rest areas at Ten Mile River, Mongaup and the South District Ranger Station and four fishing access sites; soil erosion control plans would be developed to keep sedimentation to a minimum.

Conclusion

Existing water quality would be maintained by precluding development of certain incompatible uses. Minor increases in nutrient, sediment and bacteria levels in a few river tributaries may result from new residential development.

3. Impacts on Important Species

Impacts from New Development

As with Alternative 1, local land use controls conforming to the Land and Water Use Guidelines would serve to protect important species from the adverse impacts of new development, especially ordinances requiring review of new structures within 100 feet of the mean high water mark and ordinances requiring conditional use review for new construction on slopes of 15% or greater in grade.

With adoption of a modified River Management Plan, it is expected that about 75% of the river corridor would be subject to local ordinances controlling new development within 100 feet of the river. Similarly, local ordinances controlling development on steep slopes would cover about 75% of the corridor. This would result in increased protection of habitat areas of the bald eagle, American peregrine falcon and the timber rattlesnake.

Impacts from Recreational Facilities and Use

As under Alternative 1, fifteen public recreational, visitor and interpretive facilities encompassing 130 acres would be developed by the NPS (see Map 3 for general locations). These facilities would be sited to minimize loss or damage to important species. New intensive recreational use facilities would be prohibited in scenic segments, while local site plan review would be required in recreational segments. However, increased recreational use could adversely impact important species habitat areas, through inadvertent trampling by recreationists walking on islands and along riverbanks.

Conclusion

Important species habitat within about 75% of the corridor would be protected from potential loss or damage due to new development. Impacts from recreational use would be minimized through careful siting of new facilities.

4. Impacts on Scenic Resources

Introduction

Under the modified plan alternative, it is assumed that 10 of the 15 towns would adopt land use ordinances in conformance with the proposed Land Use Guidelines. The impacts of this action are thus quite similar to those of the proposed action, although a somewhat smaller land area -- about 75% of the corridor as compared to 85% -- would be protected from high density new development and incompatible land uses through local ordinances.

Impacts on Scenic Quality of Riverbanks

Under this alternative it is assumed that 10 of the 15 towns would likely adopt zoning measures regulating new development within a 100 foot setback from the mean high water line. This would limit impacts of new development along approximately 110 river miles (out of 147).

Impacts on Scenic Quality of Ridgelines

Under this alternative, it is assumed that 10 of the 15 towns would likely adopt zoning measures requiring that no buildings were located so close to the ridgeline as to exceed the height of treeline when viewed from the river. It can be assumed that impacts would be largely the same as those of the preferred alternative, given the relatively small amount of ridgeline development that would be expected to occur.

Impacts on Scenic Quality of Steep Slopes

Under this alternative, it is also assumed that 10 of the 15 towns would likely adopt zoning measures requiring conditional use review and/or a professional engineer's plan for development on slopes of 15% or greater. While the precise effects of this action would be dependent on review criteria established by each town, new development would be expected to be reduced or altered in location on steep slopes in about 75% of the corridor (an area which also comprises about 75% of the total 27,000 acres of steep slopes within the corridor).

Corridor-wide Impacts

Expected town conformance with the Land Use Guidelines would result in limiting lot coverage to 10%, thereby indirectly reducing building size and the extent of its visual impact on natural cover. Limitations on clear-cutting would help to retain natural vegetation on the forested slopes of the corridor. Limitations on height of principal structures would ensure that new structures were not visually obtrusive, and were of a height compatible with the area's existing character. Limitations on off-premises advertising signs, housing density limits of a maximum of one unit per two acres outside of hamlets, and the prohibition of the incompatible uses listed in the Land Use Guidelines would all serve to protect the majority of the river corridor against visual intrusions that could detract from its scenic quality.

Conclusion

About 75% of the river corridor would be expected to be covered by local land use controls which would protect scenic resources from the potential negative impacts of new development and incompatible land uses.

5. Impact on Recreation Use

Because the same level of facility development is proposed, the impacts under this alternative will be the same as those under Alternative 1. There is a slight difference in the percentage of the corridor in which scenic resources would be conserved, but not enough to make an appreciable difference in the quality of the recreation experience.

A major difference will be the lack of a Management Council to coordinate and be responsible for achieving the Water Use Program. The National Park Service will assume the role of the Upper Delaware Management Council as outlined in the proposed River Management Plan.

Conclusion

The proposed public facilities will adequately meet present and future needs. The private sector will be able to adequately accommodate camping needs. The quality of the recreation experience will be maintained or enhanced under this alternative.

6. Impacts on Historic and Archeological Resources

Impacts from NPS facility development

NPS facility development would be the same as under the proposed alternative, including a major visitor contact facility, bridge parking areas, and river rest stops. The same procedures for archeological clearances and mitigation would apply as under the proposed alternative.

Impacts from NPS management and interpretation activities

The sites proposed for acquisition under Alternative 1 -- the archeological site at Ten Mile River and D & H Canal Locks 58 and 72 -- would be acquired under this alternative, and NPS would also continue to pursue cooperative agreements for the interpretation or protection of specific sites, as outlined in the proposed plan (see Chapter II/B.1). The key difference is that NPS would be more likely to acquire land: up to 7,340 acres could be acquired within towns found not to be in conformance with the RMP or the Land and Water Use Guidelines, if such acquisition were found necessary to avert clear and direct threats to resources. NPS could thus acquire significant cultural resource sites that were threatened by incompatible development. Such sites would be either managed by NPS or protected by facade and conservation easements and resold. The protection and interpretation of cultural resources through state and local programs would continue, but without coordination by the Upper Delaware Management Council.

Impacts from recreational use

Impacts of river recreation on cultural resource sites, and law enforcement actions by NPS and the municipalities would remain the same under this alternative as under under the proposed alternative. River patrols would be increased, minimizing litter, trespass and vandalism, and resulting in an increased level of protection to historical and archeological resources near the river.

Impacts from new development

Residential development on floodplain terraces would be expected to continue to occur, as described under Alternative 1. NPS would have the authority to acquire significant threatened archeological or historic resource sites within towns not in conformance with the RMP or the Guidelines.

Conclusion

Cultural resources would be protected from clear and direct threats from incompatible uses. Coordination and cooperation among federal, state and local programs would be initiated by NPS in the absence of a Management Council.

7. Impacts on Landowners

Impacts from Land Use Regulations and Acquisition

1. Interference with use of private property

It is likely that ten of the towns comprising 75% of the corridor would modify local regulations in accordance with plan objectives. Impacts on landowners would be the same as described under Alternative 1.

2. Land Acquisition

As under Alternative 1, approximately 130 acres would be acquired from willing sellers for recreational facility development. Up to 7,340 acres (15% of the corridor) could conceivably be acquired through condemnation under this alternative if necessary to avoid clear and direct threats to resources. It is unlikely that this much acquisition would occur because most of the towns would be in conformance with the modified RMP and the Guidelines.

Impacts from Litter and Trespass

Implementing this alternative would result in a reduction of litter and increased local enforcement regarding trespass violations. The impacts would be similar to those which would occur under Alternative 1.

Conclusion

Changes in local land use regulation would occur, in response to the RMP and Guidelines. Landowners planning listed as incompatible in the Guidelines would be adversely affected. However, most landowners would be benefitted by increased limitations on proposed incompatible uses. The impacts from litter and trespass would decrease.

8. 'Economic Impacts

Impacts on Municipal Finances

The National Park Service could conceivably acquire up to 7,470 acres (up to 7,340 through condemnation and 130 through acquisition for facility development) of land under this alternative. Acquisition of this magnitude if it occurred, would negatively affect the tax rolls of towns and townships, since the property tax generating ability of a substantial amount of land would be lost. This acquisition would be concentrated in those few towns not in conformance with the Land Use Guidelines.

This evaluation, using Munley and Aronson's method of evaluating financial impacts, assumes the following growth trends over a 10 year period:

A 28% increase in river visits
A 10% increase in second home development
A 5% increase in retirement population

The 28% increase in river visits over 10 years is identified in Appendix C. A 10% increase in second home development indicates a decrease from existing trends, because given some federal acquisition, less land would be available for development. Retirement population remains constant. Figure IV.2 reflects the additional expenditures expected to result under these growth trends. Again, retirement population causes the most significant increases in municipal expenditures. The nine towns experiencing financial gains from vacation home ownership would not experience as large a benefit as they do under Alternatives 1 and 2. Annual tax increases over a 10 year period are still quite minor.

Impacts on Land Values

Impacts on land values would be similar to those described under Alternative 1. However, if substantial federal land acquisition were to occur the number of private land transactions could decrease in proportion to the amount of land removed from the market. Although the location of such acquisition is unknown, the expected effect would be an increase in scarcity resulting from a reduction in the number of buildable lots. Scarcity would increase land prices.

Table IV.2
Effects on Township Expenditures for Alternative III Over a 10 Year Period
(Dollar Values in Thousands of Dollars)

		Additional Expenditures Due To An Assumed Increase In:			All Three Fa	
	1982 Total Expenditures	Retirement Population	Recreation Visits	Second Home Ownership	Total	Annual T Increase 10 Year
Hancock	$ 592.1	$ 27.0	$ 12.5	$ [0.5]	$ 39.5	.59%
Deerpark	716.8	33.0	10.1	4.4	47.5	.71%
Cochecton	423.6	18.9	8.8	[2.7]	25	.59%
Delaware	524.2	23.5	10.9	[0.5]	33.9	.38%
Fremont	337.0	17.6	8.5	3.7	29.8	.82%
Highland	512.6	17.8	9.0	[5.9]	20.9	.46%
Lumberland	533.8	20.0	10.5	[6.2]	24.3	.46%
Tusten	482.3	14.8	7.1	[1.8]	20.1	.32%
Lackawaxen	229.2	9.2	2.8	[2.0]	10	.38%
Shohola	140.4	5.7	2.2	[1.8]	6.1	.38%
Westfall	206.7	2.8	1.1	[0.3]	3.6	.17%
Berlin	156.5	5.3	3.1	0.7	9.1	.59%
Buckingham	95.7	3.2	1.5	0.7	5.4	.52%
Damascus	397.9	16.7	9.4	3.9	30.	.76%
Manchester	176.5	6.8	3.2	1.5	11.5	.62%

Assumptions: 28% growth in visitation
10% growth in second home ownership
5% growth in retirement population

Brackets indicate negative numbers

Source: Based on Munley and Aronson, 1985

Conclusion

If substantially increased federal land acquisition were to occur, towns not in conformance with the RMP and Guidelines could realize a loss of property tax. As under Alternative 1, land prices would continue to increase in the river corridor.

F. Irretrievable Commitments of Resources and Unavoidable Adverse Effects

1. Alternative 1, Proposed Action

Acquisition of approximately 130 acres would cause the conversion of this land from private to public ownership; and the development of new NPS facilities would cause the conversion of approximately 20 acres of this undeveloped land to intensive uses. Neither action represents an irretrievable commitment of resources.

Adverse impacts of existing trends in recreational use would consist primarily of localized noise, degradation of air quality from increased traffic, and the possible trampling of species habitat.

No severe long term adverse effects are expected to result from adoption of the proposed action. Construction of new residential development would have minor adverse short term effects on certain tributary watersheds, resulting from localized soil erosion and sediment loading. Erosion and sedimentation problems would be increased in those areas without restrictions on development on steep slopes and erodible soils. These unavoidable effects would be experienced in roughly 15% of the corridor. New development would also increase non-point source pollution from the malfunctioning of residential septic systems. One consequence would be minor increases in levels of fecal coliform bacteria in localized areas.

Additional loss of archeological sites may result from recreational use and continue residential development in archeologically sensitive areas near the river. Because no complete record of archeological sites exists, the extent and severity of such loses cannot be predicted. Important species habitat may inadvertently be destroyed through recreational use in localized areas.

2. Alternative 2, No Action

Under this alternative there would be no further development of NPS facilities, causing no federal conversion of undeveloped land. Other unavoidable effects described for alternative 1 would be magnified. Unavoidable erosion and sedimentation problems resulting from new residential and commercial development would affect approximately 65% of the river corridor. Major incompatible uses would be unrestricted in about 35% of the corridor, causing localized declines in water quality. Minor reductions in the productivity of area fisheries may result from slight declines in water quality in tributary streams.

The cumulative consequences of increased construction near the river in about two thirds of the corridor, as well as increased recreational use, would pose threats to archeological resources and to important species habitat within the corridor.

3. Alternative 3, Modified RMP

With federal acquisition of up to 7,470 acres of land, a substantial amount of land could be converted from private to public ownership. The unavoidable effects of NPS facility development would remain the same as under Alternative 1.

Approximately 20% of the corridor would be unprotected from intensive or inappropriately located residential development or incompatible land uses, resulting in minor erosion, sedimentation and other water quality problems.

With no controls of development adjacent to the river in about 35% of the corridor, important species habitat would be potentially subject to degradation. Loss of archeological sites could also result from recreational use facility development and continued residential development.

CHAPTER V - CONSULTATION AND COORDINATION

A. Development of the Draft EIS

This section describes the process used to determine the issues and alternatives which have been analyzed in this Draft Environmental Impact Statement (DEIS).

1. Scoping

After designation of the Upper Delaware into the Wild and Scenic Rivers System, efforts were begun to develop a River Management Plan (RMP). A draft RMP/EIS was completed in October 1982 and a revised draft River Management Plan was issued in October 1983. Considerable public controversy upon release of the documents led to a decision that a new plan was needed. This RMP was to be prepared by the Conference of Upper Delaware Townships in cooperation with riparian landowners, the State of New York, the Commonwealth of Pennsylvania, the Delaware River Basin Commission, county governments, citizens' groups and the National Park Service (NPS).

As the proposed RMP neared completion, the National Park Service began work on this DEIS. The Notice of Intent announcing the preparation of the proposed River Management Plan and draft Environmental Impact Statement was published in the Federal Register July 16, 1985.

Several techniques were used to inform the public about the DEIS. First, the proposed RMP/draft EIS process has received extensive and thorough media coverage. The area newspapers in particular have frequently reported the ongoing activities of the Council of Upper Delaware Townships, Citizens Advisory Council, and NPS throughout the planning process. Newspaper articles were reviewed for information regarding issues. Second, the Citizen's Advisory Council provided an open forum for public comment. Third, NPS directly informed citizens and groups of the preparation of both documents. Comments were solicited through periodic mailings which included background material, status updates, and a summary of the scoping meetings. Contact was established with those people who have been involved with the proposed RMP, and maintained through a mailing list compiled by NPS, which included all those identified in Chapter V, Section B.

In developing this draft EIS a series of meetings were held to involve the public, and federal, state and local agencies in identifying what alternatives and issues should be addressed. These meetings, referred to as scoping meetings, helped NPS staff decide what would be covered in the EIS.

Six scoping meetings, one for the general public and five involving government agencies, were held in July and early August 1985, to discuss the proposed RMP/draft EIS. A summary of these meetings can be found in Appendix A. Questions and comments from the public and agency representatives dealt with issues such as the effectiveness of cooperative responsibilities for managing resources, the economic impacts to the communities, control of water flow, and the definition of the river corridor's boundary. Possible alternatives to the proposed plan were also discussed.

2. Formulation of Issues

Planning Issues

There are several areas of concern that surfaced during the course of the planning effort. The proposed RMP addresses these concerns to the maximum extent possible.

1. Where should the boundary be located?

Over the years, there has been considerable discussion about the appropriate location of the boundary of the Upper Delaware National Scenic and

Recreational River. The 1978 legislation identifies a corridor of 79,435 acres, which is now in place and which defines the river and surrounding landforms. The enabling legislation provides for modifications to the boundary based on river-related resource criteria. The proposed RMP includes such modifications, resulting in a revised boundary encompassing 56,095 acres.

2. What level of recreational use and management is appropriate?
Another area of public concern is the amount and type of recreational use that the river and its corridor can sustain without adversely affecting natural, scenic, and cultural resource values. The amount and type of additional facilities which are needed to manage recreation use must also be identified. A number of recreation related problems such as safety, littering, trespassing, vandalism and conflicts in use were also outlined.

3. How will land use be managed?
The need to manage future land uses in the corridor to meet the objectives of the Wild and Scenic Rivers Act must be balanced with the rights of landowners to use their land. Valley residents show a strong desire to maintain local control of land use decisions, and to safeguard private property rights. There is opposition to federal acquisition, or federal use of eminent domain, and there is concern over the extent to which traditional land uses on private property might be regulated under the proposed plan.

4. How will the region's economy be sustained?
This issue involves balancing the continuation of traditional and commercial land uses with an appropriate level of resource conservation in order to maintain the region's economic base while meeting the objectives of the Wild and Scenic Rivers Act. There is concern about the effect of the proposed plan on land values, and the costs to local government of

implementing the plan. The degree to which existing commercial boating businesses would be influenced under the proposed plan was identified as a concern.

5. Who will be responsible for river management?
There is concern over the way that the responsibility for managing the Upper Delaware River corridor will be shared among local, state and federal agencies and the private sector in order to address the above-mentioned issues while meeting the objectives of the Wild and Scenic Rivers Act and the enabling legislation.

First, there is a strong concern that the Upper Delaware area should be managed cooperatively by all levels of government, and that local governments retain the primary land management responsibility for the area. While the Upper Delaware is a unit of the National Park System, it is not classified as a national park and is to be managed as a Wild and Scenic River in accordance with the intent of the enabling legislation.

Second, there is a widespread concern that the current system of water quality and quantity management and monitoring is inadequate to protect the river's fishery, as well as its water quality.

Environmental Issues

During scoping, a range of environmental and social issues were identified. They included the following:

recreational use
municipal services
water quality
water flow
scenic resources
natural features
land uses

timbering
hydropower
transportation systems
boating
width of the corridor
agricultural resources
acquisition
economic resources

The EIS study team, based on further discussion with resource experts and review of existing information, also identified additional issues such as:

historic resources
archeological resources
threatened or endangered species
floodplains
landowner concerns
wetlands
mineral resources

Based on additional research, and a review of data, the study team defined the major environmental issues as:

1. Fisheries - Impact on the sportfishery which includes trout, bass, and shad.
2. Water Quality - Impact on surface water and groundwater quality.
3. Important Species - Impacts of new development and land uses on important plant and mammal species.
4. Scenic Resources - Impacts of new development on the scenic quality of the area.
5. Recreational Use - Impact on the recreational experience and recreational facility needs.
6. Cultural Resources - Impacts on archeological and historic resources.
7. Landowner Impacts - Impact of litter and trespass on private land and impacts on private land uses.
8. Economic Impacts - Impacts on land values and the costs to local governments implementing the plan.

All of the issues raised during the scoping process were considered. However, after review, it was decided not to analyze all of these issues. Below are seven topics which were considered, but not analyzed in detail because of the reasons cited:

1. Water Flows

As described in Chapter III/C.11, the river's flow is managed under a United States Supreme Court decree. Any actions which affect flow management are beyond the scope of this planning effort and therefore, flows are not analyzed as an impact topic.

Future projects which affect water flows, such as dams, hydropower development and diversions on or directly affecting the Upper Delaware, fall under the provisions of Section 7(a) of the National Wild and Scenic Rivers Act. No federally funded licensed or initiated projects can be developed which have a direct or adverse impact on river values.

2. Use Levels

Several studies have been conducted regarding recreation use levels on the Upper Delaware during the development of the proposed plan. It was determined that additional data and study were needed prior to determining appropriate use levels. It was decided that a Recreation Use Study would be undertaken by NPS to provide needed information. Because this study is underway, the proposed plan does not recommend optimum use levels or carrying capacity at this time. However, in order to assess needs and demands for the purposes of this DEIS, existing data was used to assess the effects of the proposed plan.

3. Timbering

Most of the timbering that goes on in the corridor occurs on private land. The Land Use Guidelines do not prohibit timbering, but recommend the use of good management practices. Because timbering is considered a traditional use and because the extent to which it occurs or will occur is likely to be small, the impacts on timbering and its resultant effects are expected to be minor and therefore were not analyzed. Impacts of the limitations on clear cutting in the Land Use Guidelines on scenic quality have been analyzed.

4. Agriculture

Because the Land Use Guidelines encourage typical agricultural uses, no impacts from the plan on agriculture are expected. Agriculture represents 3 1/2% of the land use in the area. It is expected that this use will continue although some agricultural land may be coverted to residential uses.

5. Floodplains

Areas that are prone to flooding are identified as the 100-year floodplain. The Land Use Guidelines do not preclude development in this area, although setbacks from the mean high water mark proposed in the Guidelines would limit floodplain development to some extent. Other federal, state and local regulations limit floodplain development, as well.

6. Wetlands

There are few wetland areas in the corridor. The Land Use Guidelines do not affect development in these areas, however, state and local regulations do. Because no effects from the River Management Plan are expected, this topic was not analyzed.

3. Identification of Alternatives

Previous Planning

The alternatives considered were derived from previous planning efforts and the EIS scoping meetings. The previous planning efforts considered a broad range of alternatives for conserving the river area. The choices were narrowed with the passage of the enabling legislation. The previous alternatives considered are described below.

After the Upper Delaware's national designation as a study river in 1968 under the Wild and Scenic Rivers Act (P.L. 90-542) a study team was organized. Between 1969 and 1976, a qualification study and environmental impact statement were developed. During that seven year period a variety of alternatives were considered and discussed. A final environmental impact statement was released in 1976 that considered the following alternatives:

1. No Action/No Designation - Under this alternative the Upper Delaware would not be included in the National Wild and Scenic Rivers System.

2. Information Management - This objective was to establish a managing or coordinating agency with visitor contact facilities for orientation and information services with little other responsibility. Also proposed were:

   - 15,000 acre corridor, 75 mile length
   - acquire 35 acres in fee
   - use easements, zoning, use agreements on remaining 14,965 acres
   - managing body responsible for coordination and visitor management

3. Strip Management - This alternative increased the managing agency's responsibility in resource protection and facility management. Also proposed were:

   - 15,000 acre corridor, 75 mile length
   - acquire 4000 acres in fee (200 ft on both sides)
   - conserve 11,000 acres in less than fee
   - managing body responsible for resource protection and recreational facilities

4. Control Management - This alternative increased preservation and facility development.

   - 15,000 acre corridor, 75 mile length
   - acquire 6000 acres in fee
   - conserve 9000 acres in less than fee
   - managing body with greatest responsibility for resource protection and recreational facilities

5. Different Segments - Under this alternative, boundary changes were proposed that would decrease the length of the river area and increase the width of the corridor.

   a. Hancock, NY to Westcolang, PA

      - 50,000 acre corridor, 51 miles in length
      - acquire 400 acres in fee
      - conserve 49,600 acres in less than fee
      - resource protection by zoning

   b. Lordville, NY to Matamoras, PA

      - 65,000 acre corridor, 65 miles in length
      - acquire 400 acres in fee
      - conserve 64,600 acres in less than fee
      - resource protection by zoning

6. Management Options Considered for Alternative 2, 3, 4, and 5.

   - Local Management - Land use and recreation use would be managed through local ordinances

- o Bi-State Commission - Joint state administration through a bi-state agreement
- o Delaware River Basin Commission - expanded DRBC role to regulate land and recreation use
- o Federal Management - assignment of all aspects of river management to a federal agency.

7. The 1976 Proposed Action - recommended that the river be included in the National Wild and Scenic rivers system with land protection being accomplished cooperatively and recreation management by NPS. It also called for:

   - o 75,000 (which is actually 86,000 due to a miscalculation) acre corridor, 75.4 miles
   - o land and resource protection primarily through local land use controls
   - o NPS management of recreation use

After a review of this document and after Congressional hearings, the 1976 Proposed Action was adopted with some modification and enacted into law by the National Parks and Recreation Act of 1978 (P.L. 95-625). The study team determined that there was no need to re-analyze the above alternatives because prior analyses appeared adequate.

Alternatives Considered in the DEIS

In addition to the proposed plan, other alternatives were raised during the 1985 scoping sessions. The alternatives raised included:

- o The 1983 Draft Plan
- o Strong federal role up to the maximum the law allows
- o Continuation of interim authority
- o Deauthorization
- o Limited Management Council
- o Federal acquisition

After a review of these suggestions, the following were identified as the alternatives most likely to occur. The Status Quo alternative is the baseline required for comparison.

Alternative 1: Implement RMP and Guidelines (Proposed Action).

The River Management Plan, containing Land and Water Use Guidelines, would be adopted by NPS. A Management Council, or partnership of the town governments, the State of New York and the Commonwealth of Pennsylvania the Delaware River Basin Commission and the National Park Service, would be established to coordinate actions within the river corridor. The Guidelines would provide criteria and performance standards for land and water uses and identify compatible, conditional and incompatible uses. Towns would be responsible for managing land uses consistent with the Guidelines. NPS would be responsible for managing recreation use on the river and would acquire approximately 130 acres of land as identified in the RMP to support visitor services and facilities. Overall coordination of the Plan and Guidelines would be the responsibility of the Management Council.

Alternative 2: Maintain Status Quo (No Action).
NPS would continue to manage river recreation without a River Management Plan or Management Council. There would be no formal mechanism for intergovernmental coordination and consistency. The 1985 Land and Water Use Guidelines would be used by NPS to evaluate threats to the river's resources. Minimal federal acquisition would occur to avert clear and direct threats to resources. NPS would continue present levels of public service and facilities.

Alternative 3: Implement Modified RMP.
Under this alternative, most of the towns would not support forming a Management Council. The NPS would then modify, adopt, and implement a River Management Plan. In the absence of a designated coordinating body, NPS would assume the responsibilities assigned to the Management Council in the proposed RMP. The 1985 Land and Water Use Guidelines would be used by NPS to evaluate threats to resources. NPS would acquire land to avert direct threats to resources, up to a limit of 7340 acres.

The alternatives which were considered and rejected for the purposes of this DEIS include:

1983 River Management Plan

The River Management Plan prepared in 1983 designated the National Park Service as the lead agency responsible for implementing the plan and enforcing the 1981 Land and Water Use Guidelines. An Intergovernmental Coordinating Council (ICC) would be established to review projects and coordinating overall corridor management, and a Technical Advisory Group would be established to provide professional assistance to local governments and staff support to the ICC. NPS would be responsible for coordinating overall corridor management, and a Technical Advisory Group would be established to provide professional assistance to local governments and staff support to the ICC. NPS would be responsible for conformance review and enforcement of river use regulations. Mandatory commercial use permits would be instituted. Resource conservation would rely primarily on local land use controls and existing federal and state authorities.

This alternative was and continues to be politically unacceptable. Local governments cannot be expected to support the 1983 RMP which they strongly opposed in the past and in which they lacked input, responsibility and a role in decision-making. Moreover, local governments would not be expected to conform to the RMP and Land and Water Use Guidelines, thereby reducing the effectiveness of resource protection. The values for which the river was designated would not be adequately protected.

Deauthorization

Under this alternative, the Upper Delaware National Scenic and Recreation River Legislation would be amended by Congress to remove the river from the National Wild and Scenic River System. The federal presence in the Upper Delaware region would be eliminated while the states and local governments would continue their responsibilities for management in the river corridor. A River Management Plan would not be adopted and a mechanism for local, state and federal intergovernmental coordination in river-related activities would not exist. Land and resources would be regulated through existing land use controls and development in the river corridor would continue. NPS would not manage recreational use on the river and would not provide funding for acquisition, development, law enforcement, trash collection or planning along the river. Deauthorization would eliminate the protection that is provided to rivers in the National Wild and Scenic Rivers System from reservoirs, hydropower development, and other federally licensed, permitted, funded or initiated activities that have the potential to adversely affect river resources.

The deauthorization alternative identical to the no action alternative in the 1976 EIS, was previously considered and rejected prior to its designation by Congress. The river would not be protected from resource threats, and recreation use would not be managed. It is also contrary to the enabling legislation and the Department of the Interior's policies.

Limited Management Council

This alternative assumes that the 1985 proposed River Management Plan and revised Land and Water Use Guidelines would be accepted by most local governments, the Delaware River Basin Commission, the States, and the National Park Service. However, many of the towns would choose not to participate on the management council yet agree to conform to the River Management Plan and Guidelines. In areas where towns choose not to participate, they would work directly with NPS without the benefit of the council. This alternative was not evaluated separately because its impacts would be essentially the same as Alternative 3: Implement a Modified RMP.

Federal Acquisition

A traditional federal method of protecting important resource areas is through public acquisition. Significant portions of the river would be proposed for purchase and management by the federal government under this scenario. This alternative is impractical because of its high cost. It would also cause severe impacts on those now living in the area because it would displace residents, affect the local tax base, and impact businesses in the area. This alternative has been rejected because it would be contrary to the spirit and intent of the enabling legislation.

B. Distribution of the EIS for Public Review

ELECTED OFFICIALS

New York

- Governor Mario Cuomo
- Honorable Alfonso D'Amato, U.S. Senate
- Honorable Daniel Patrick Moynihan, U.S. Senate
- Honorable Benjamin Gilman, U.S. House of Representatives
- Honorable Matthew McHugh, U.S. House of Representatives
- Honorable Charles Cook, New York Assemblyman
- Honorable Richard Coombe, New York Assemblyman
- Honorable Mary McPhillips, New York Assemblyman

Pennsylvania

- Governor Richard Thornburgh
- Honorable John Heinz, III, U.S Senate
- Honorable Arlen Specter, U.S. Senate
- Honorable Joseph McDade, U.S. House of Representatives
- Honorable William W. Foster, U.S. House of Representatives
- Honorable Charles D. Lemmond, Jr., State Senate

FEDERAL AGENCIES

- Advisory Council on Historic Preservation
- Department of Agriculture, Regional Offices
  - Farmers Home Administration
  - Forest Service
  - Soil Conservation Service

FEDERAL AGENCIES (continued)

- Department of Commerce
  - National Oceanic and Atmospheric Administration
  - National Marine Fisheries Service
- Department of Defense, Regional Offices
  - U.S. Army Corps of Engineers
- Department of Housing and Urban Development, Regional Offices
- Department of the Interior
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Bureau of Reclamation
  - U.S. Fish and Wildlife Service, Regional Offices
  - U.S. Geological Survey, Regional Offices
- Department of Transportation
  - U.S. Coast Guard
  - Federal Highway Administration
- Environmental Protection Agency, Regional Offices
- Federal Emergency Management Agency
- Federal Energy Regulatory Commission
- Interstate Commerce Commission

REGIONAL AGENCIES

- Delaware River Basin Commission
- Interstate Bridge Commission

STATE AGENCIES

- New York
  - Department of Agriculture and Markets
  - Department of Environmental Conservation
  - Department of Health
  - Department of Public Service
  - Department of Transportation
  - Office of Parks, Recreation and Historic Preservation

- Pennsylvania
  - Department of Agriculture
  - Department of Commerce

Department of Community Affairs
Department of Education
Department of Environmental Resources
Department of Transportation
Fish Commission
Game Commission
Governor's Energy Council
Historical and Museum Commission
Public Utility Commission

LOCAL AGENCIES AND ORGANIZATIONS

- Citizens Advisory Council
- Conference of Upper Delaware Townships
- New York
    - Delaware County
    - Orange County
    - Sullivan County
        - Town of Cochecton
        - Town of Delaware
        - Town of Fremont
        - Town of Highland
        - Town of Lumberland
        - Town of Tusten
        - Town of Hancock
        - Town of Deerpark

- Pennsylvania
    - Pike County
    - Wayne County
        - Lackawaxen Township
        - Shohola Township
        - Westfall Township
        - Berlin Township
        - Buckingham Township
        - Damascus Township
        - Manchester Township
- Soil and Water Conservation Districts

ORGANIZATIONS AND BUSINESSES

- Abnaki Canoe Club
- American Canoe Association, Atlantic Division
- American Rivers Conservation Council
- Appalachian Mountain Club, Delaware Valley Chapter
- Barryville Kayak, Inc./Delaware Valley Organization for Recreation (DVOR)
- Catskill Center for Conservation and Development, Inc.
- Catskill Waters
- Century Hotel
- C&O Canal Association
- Upper Delaware Citizen's Alliance
- Citizens for Preservation of Our Local Heritage
- Columbia Gas System Service Corporation
- Damacus Township River Association
- Friends of the Earth
- Lackawanna Audubon Society
- Maryland Conservation Council
- Mountaineer Rod & Gun Club
- National Audubon Society
  - Northeast Regional Office
  - Mid-Atlantic Regional Office
- National Parks and Conservation Association
- Orange and Rockland Utilities, Inc.
- Pennsylvania Recreation and Park Society, Inc.
- Pike County Federation of Sportsmen's Clubs, Inc.
- Point Pleasant Canoe Rental & Sales
- Potomac River and Trails Council
- Sebago Canoe Club
- Sierra Club
  - Atlantic Chapter
  - New Jersey Chapter
  - Northeastern Group, Pennsylvania Chapter
- Theodore Gordon Flyfishers Inc.
- Trout Unlimited
  - Al Hazzard Chapter
  - Endless Mountains Chapter
  - Pennsylvania Council

Wanda Canoe Club
Watershed Association of the Delaware River
White Water Canoe
Wilderness Society

Also included will be the local media, landowners and other interested individuals who have requested to be part of the EIS review process.

C. List of Preparers

This Draft Environmental Impact Statement was prepared by staff members of the Division of Park and Resource Planning of the Mid-Atlantic Regional Office of the National Park Service. Joseph DiBello served as the Project Leader. Planners that assisted in the effort included: Patricia Bentley, Barron Bohnet, Martha Crusius, Jonathan Doherty, Gene Gilroy, Alicia Kale, Kathryn Kester, Janet Kroupa, David Lange, Carol Menke, Dixie McKinnon, Debra Miller, Wayne Senville, Aubrey Sherif, and Suzanne Sutro. The staff members have a broad range of educational backgrounds and expertise in the areas of regional and urban planning, landscape architecture, environmental economics, forest management, cartography, biology, geography, recreation management, environmental law, and social science.

Clerical staff included Connie Estrada, Martha Hollis, Sharon Hucks, Louvinia Madison, and Gay Sprowal. Delores Sciulli served as Clerical Supervisor.

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APPENDIX A - SUMMARY OF EIS SCOPING MEETINGS

In developing this draft EIS a series of meetings were held to involve the public, and federal, state, and local agencies in identifying what issues should be addressed. These meetings, referred to as scoping meetings, help decide what will be covered in the EIS and are a first step in its development. Scoping will continue throughout the process.

The topics covered during each of the scoping meetings were:

1 - A general overview by NPS of the EIS, including what it is, why it is being developed, how it will be used and the schedule for its development

2 - A planning history and background of the RMP

3 - A discussion of major impacts which should be addressed

4 - A discussion of alternatives to the proposed plan

Highlights of these scoping meetings are described below:

1. Council of Upper Delaware Townships (COUP) - Fosterdale, N.Y., July 23, 1985

After introductory remarks by NPS, COUP members discussed the impacts of the proposed plan. The first issue raised was the economic impact of the plan. A major concern was the effect of the plan on local government services such as police protection, trash removal, traffic, medical support, fire, road maintenance, and schools. Recreation use was discussed, and the need for assessing impacts of use levels, taking social, as well as environmental factors into account. The impacts of the plan on water resources, specifically on groundwater and flows, were also discussed.

In terms of alternatives, the COUP members present indicated that the proposed plan should be the focus of the EIS. A suggested alternative was the 1983 draft river management plan.

2. Counties - Upper Delaware Headquarters, July 25, 1985

Representatives from Wayne and Pike Counties, Pennsylvania, and Delaware, Orange and Sullivan Counties, New York, were invited to discuss the EIS. Environmental issues that need to be assessed that were identified at this meeting included water quality, scenic resources, natural features, fisheries, water flow, regional growth, and recreational use. Detailed information relating to these issues was provided by the participants. There was strong concurrence that the EIS should clearly delineate regional development trends and try to assess how the plan might affect these trends.

The alternatives suggested at this meeting included:

1) Proposed River Management Plan
2) Stronger federal role
3) No Action or a continuation of existinq interim authority
4) 1983 Plan
5) No federal National Scenic and Recreational River Designation

3. Citizens Advisory Council (CAC) - Narrowsburg, NY, July 26, 1985

Those present indicated that plan impacts on land use, recreation use, water quality, fisheries, farming and timbering should be addressed. Suggested alternatives, in addition to the proposed RMP, included:

1) Continuation of existing interim powers by NPS
2) Deauthorization
3) A strong federal role with acquisition up to the limits of the law

NPS was advised by the CAC that given the amount of planning previously undertaken and the courses of action already considered over the years, the EIS should only address practical and reasonable alternatives.

4. Commonwealth of Pennsylvania Agencies - Harrisburg, PA, July 30, 1985

Pennsylvania agency representatives expressed concern regarding water flow issues on the Upper Delaware. The Fish Commission representative commented that the impacts on fishing and boating need to be addressed in the EIS. There was some discussion on how to integrate transportation planning with the planning for the Upper Delaware.

In terms of alternatives, it was suggested that NPS look carefully at previous planning concepts since some of the earlier alternatives had valuable features which should be considered.

5. New York State Agencies, Albany, NY, August 6, 1985

The agencies' representatives noted that the impacts of the plan on water flows and releases, hydroelectric development, agricultural resources, land uses, town services, recreation use, natural features, and boundary delineation should be addressed. Specific information on these topics was provided by participants.

In addition to the proposed plan, it was felt that the impacts of partial consistency with the plan could be assessed. An alternative was suggested in which some of the towns agree to participate as part of the Management Council and others do not.

6. Federal Agencies, Delaware River Basin Commission and Interstate Bridge Commission Meeting, Philadelphia, PA, August 8, 1985

Federal and interstate agency officials stressed that the EIS should fully explain the approach to planning and managing the UPDE because it represents a unique cooperative effort. It was suggested that valid information from earlier studies be used to the extent possible. General impacts discussed included water flow, floodplain management, cultural resources, and agricultural lands. In addition, agency representatives commented on areas of interest relevant to their programs. No alternatives were suggested at this time.

APPENDIX B - ENDANGERED SPECIES CONSULTATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

August 7, 1985

Barbara E. Stratton
Outdoor Recreation Planner
U.S. Department of the Interior
National Park Service
143 South Third Street
Philadelphia, PA 19106

Dear Ms. Stratton:

This is in response to your letter to Mr. Charles J. Kulp dated July 16, 1985, requesting information on the presence of federally listed or proposed endangered and threatened species in the vicinity of the Upper Delaware National Scenic and Recreational River in Pike and Wayne Counties, Pennsylvania.

Two federally listed endangered birds are expected to be found as transient species in the project area. They are: bald eagle (Haliaeetus leucocephalus) and peregrine falcon (Falco peregrinus). There is no listed critical habitat for these species in the project area.

The project area is within the historic range of the Indiana bat (Myotis sodalis), but there are no populations of this species known to occur there. The distribution of this species is strongly correlated with the major rivers within its range and it has been postulated that the major rivers are migration routes. Although suitable habitat for nursery colonies may be found within the vicinity of the project, we have no evidence that any Indiana bat nursery colonies exist in the project area.

The small whorled pogonia, an endangered plant, presently exists or has been known to occur in 16 eastern states and Canada. It is most often found in mixed second growth hardwoods with a relatively open canopy and little shrub or herbaceous cover. It has been found, however, in a broad spectrum of conifer/hardwood habitat types and, in fact, may be found almost anywhere in the eastern United States. There are many as yet unanswered questions about its growth, reproduction and other life requirements.

There are presently 18 known existing populations (approximately 600 individuals) of this plant in the eastern U.S. and Canada. Although additional populations could occur almost anywhere, the chances of occurrence at any particular site are extremely remote. The Pennsylvania locations of historical populations are: Berks County (Reading), Chester County (West Chester), Green County (Rogersville), Monroe County (East Stroudsburg), Montgomery County (Willow Grove) and Philadelphia County (Philadelphia). The only known existing populations in Pennsylvania are located in Centre County near the town of Port Matilda, and in Venango County near the town of Cranberry. To reduce the chance of disturbance by plant collectors, exact locations of plants are not released. We have no information to confirm the presence of these plants within your project area.

Except for the above species, no other federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. We have no information to indicate that any of the above species except bald eagles are likely to be found within your project area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 384, as amended; 16 U.S.C. 1531 et seq.) is required with the Fish and Wildlife Service. A compilation of federally listed endangered and threatened species in Pennsylvania is enclosed for your information.

The Pennsylvania Game and Fish Commissions should be contacted for information regarding resident and State listed species. The Pennsylvania Game Commission can provide you with detailed fish and wildlife information from their computerized Pennsylvania Fish and Wildlife database. Ms. Cathy McKenna at (PA Natural Diversity Inventory, 34 Airport Dr., Middletown, PA 17057-5080) can provide you with detailed records of plant and animals of concern that have been identified in your study area and should be addressed in your E.I.S.

The Fish and Wildlife Service has mapped wetlands within part of your study area. These maps are available from Mr. Ralph W. Tiner Jr. at U.S. Fish and Wildlife Service, One Gateway Center, Newton Corner, MA 02153.

We have forwarded a copy of your letter to the Cortland, New York office for response regarding the New York State portion of your project area.

We would like to review any draft and final documents that you produce relating to fish and wildlife resources. If we can be of further assistance, please contact me.

Sincerely,

Richard W. McCoy

Richard W. McCoy
Acting Field Supervisor

Enclosure

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN PENNSYLVANIA

on Name	Scientific Name	Status	Distribution
IES:			
Cisco, longjaw	*Coregonus alpenae*	E	Lake Erie - probably extinct
Pike, blue	*Stizostedion vitreum glaucum*	E	Deep water of Lake Erie - probably extinct
Sturgeon, shortnose*	*Acipenser brevirostrum*	E	Delaware River & other Atlantic coastal rivers
ILES:			
None			
S:			
Eagle, bald	*Haliaeetus leucocephalus*	E	Entire State - nests only in Crawford County
Falcon, American peregrine	*Falco peregrinus anatum*	E	Entire State - re-establishment to former breeding range in progress
Falcon, Arctic peregrine	*Falco peregrinus tundrius*	E	Entire State migratory - no nesting
Warbler, Kirtland's	*Dendroica kirtlandii*	E	Western Pennsylvania - occasional migrant
LS:			
Bat, Indiana	*Myotis sodalis*	E	Entire State - only known wintering population in PA is in Blair County
ougar, eastern	*Felis concolor cougar*	E	Entire State - probably extinct
ox squirrel, Delmarva	*Sciurus niger cinereus*	E	Southeastern PA - probably extirpated

Federally listed endangered and threatened species in Pennsylvania (continued)

MOLLUSKS:

Pearly mussel, orange footed	Plethobasus cooperianus**	E	Ohio River drainag no recent collecti
Pearly mussel, pink mucket	Lampsilis orbiculata**	E	Ohio River drainag no recent collecti
Pigtoe, rough	Pleurobema plenum	E	Ohio River drainag no recent collecti

PLANTS:

Small whorled pogonia	Isotria medeoloides	E	Entire State - his populations in Ber Chester, Green, Mo Montgomery & Phila Counties Existing populatio Centre and Venango Counties

*Principal responsibility for this species is vested with the National Marine Fisheries Service.

**Since listing, Plethobasus cooperianus has been renamed Plethobasus striatus and Lampsilis orbiculata has been renamed Lampsilis abrupta.

RECEIVED
JUL 25 1985

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Management Division
Habitat Conservation Branch
14 Elm Street
Gloucester, MA 01930-3977

July 23, 1985 F/NER74:DWB

Ms. Barbara E. Stratton
National Park Service
Mid-Atlantic Region
143 South Third Street
Philadelphia, Pennsylvania 19106

Dear Ms. Stratton;

This is in response to your letter dated July 16, 1985, requesting a list of endangered or threatened species present in the area of the Upper Delaware National Scenic and Recreational River in Pike and Wayne Counties, Pennsylvania, and Sullivan, Delaware, and Orange Counties, New York pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended. We have identified the presence of no endangered or threatened species in the project area that come under the jurisdiction of the National Marine Fisheries Service. Should project plans change, or additional information on listed or proposed species become available, this determination may be reconsidered.

Sincerely,

Douglas W. Beach
Wildlife Biologist

APPENDIX C - HOUSING AND RECREATION PROJECTIONS

1. Housing Projections

Population and housing data were analyzed in order to determine the increase in housing units in the river corridor between 1980 and 2005, should current trends continue. Both housing and population can be divided into two categories: permanent and seasonal. Census data is available on the permanent population only (since seasonal residents are enumerated in their year-round places of residence) but is available on both classes of housing.

Permanent population growth for the Upper Delaware towns in the year 2005 has been projected by the New York Department of Commerce and Department of Environmental Conservation, and by the Pennsylvania Department of Environmental Resources, Division of Water Quality. Both projections are based on 1980 census data. They are used here because they are the only town-by-town projections available. The Pennsylvania projections are low--7-9% growth-- while the New York ones range from a 2% decrease (Hancock) to a 29% increase (Deerpark). Researchers have stated that household size, now at 2.7 persons, is expected to decrease by about .5% yearly, which would mean that by the year 2005 it would be at 2.6 persons (University of Oregon, 1977). If we assume that each household implies a new permanent home, we can estimate the total new housing units that would be needed for this population. This assumption does ignore the fact that these new households could convert vacant seasonal homes into year-round residences. However, the fact that the state population projections are fairly conservative should compensate for any overestimate of new housing units that results from this assumption.

Since no data are available for the seasonal population, seasonal home increase are predicted much more roughly: the increase in this category has been estimated at 20% per decade (based on projections used in Munley and Aronson, 1985). This increase is added to the increase in permanent housing units to produce total new housing units projected for each Upper Delaware town.

How many of these units are likely to be built in the river corridor? Housing units in the corridor were enumerated through aerial photograph interpretation for the years 1968 and 1983. The 1983 totals can be roughly compared with the 1980 Census data on total housing units in each town. The percentage of each town's housing units found within the corridor is shown on Table C.1. If we assume that this percentage will remain constant we can estimate that about 624 new housing units will be built within the river corridor by the year 2005. This represents an increase of about 25% over the present 2,459 housing units in the corridor in 1983. Although this projection is a very rough one, based on limited data, it seems to represent a continuation of existing trends. Between 1968 and 1983 at least 654 new housing units were built within the river corridor; an increase of 37%. An increase of 25% over the next 20 years seems to be a reasonable assumption.

TABLE C.1 UPPER DELAWARE - HOUSING PROJECTIONS

	PENNSYLVANIA TOWNSHIPS							NEW YORK TOWNS								
ITEM	BUCKINGHAM	MANCHESTER	DAMASCUS	BERLIN	LACKAWAXEN	SHOHOLA	WESTFALL	HANCOCK	FREMONT	DELAWARE	COCHECTON	TUSTEN	HIGHLAND	LUMBERLAND	DEERPARK	TOTAL 15
Population: 1960	593	558	1703	1010	1068	413	838	3907	1047	2141	1070	1087	1138	538	2777	
1970	578	494	2006	1109	1363	574	1348	3604	1047	2260	1181	1224	1377	837	4370	
1980	667	629	2536	1676	2111	986	1825	3497	1346	2783	1330	1424	1878	1210	5633	
Projected Pop.: 2005/	715	678	2729	1818	2295	1076	1969	3425	1500	3300	1500	1500	2150	1500	7275	
% increase	7%	8%	8%	8%	9%	9%	8%	-2%	11%	18%	13%	5%	14%	24%	29%	
Total Housing Units: 1980	393	439	1535	792	1526	867	833	2035	843	1171	817	943	1271	1079	2445	
% increase, 1970-1980																
Occupied (year-round) units	246	214	887	565	813	408	653	1259	499	879	500	536	742	453	2046	
Seasonal units	137	212	560	164	629	433	138	571	304	231	275	341	446	442	270	
Projected households: 2005 (pop./household size of 2.6)	275	260	1049	699	883	414	757	1317	577	1269	577	577	827	577	2798	
New housing units (households minus existing occupied units)	29	46	162	134	70	6	104	58	78	390	77	41	85	124	752	
New seasonal homes (with increase of 20% per decade, 1980-2000, minus existing units)	60	93	246	72	277	190	61	251	134	102	121	150	196	194	119	
Total new housing units	89	139	408	206	347	196	165	309	212	492	198	191	281	318	871	
Total structures in corridor, 1983	104	113	279	6	265	107	69	131	220	272	118	350	198	218	9	2459
% of total in whole town, 1980	26%	26%	18%	.7%	17%	12%	8%	6%	26%	23%	14%	37%	16%	20%	.3%	
Projected new housing units in corridor (same % of total in town)	23	36	73	1	59	23	13	18	55	113	28	71	45	64	3	624 (25% incr)

2. Visitor Use Projections

All actual visitation figures were examined. These included 1972-1982 New York State Department of Environmental Conservation figures and NPS figures (from NPS Statistical Abstract). A determination was made to use the NPS figures and mathematically "smooth" them (to smooth out the differences from the highs and lows). (See the following table and chart).

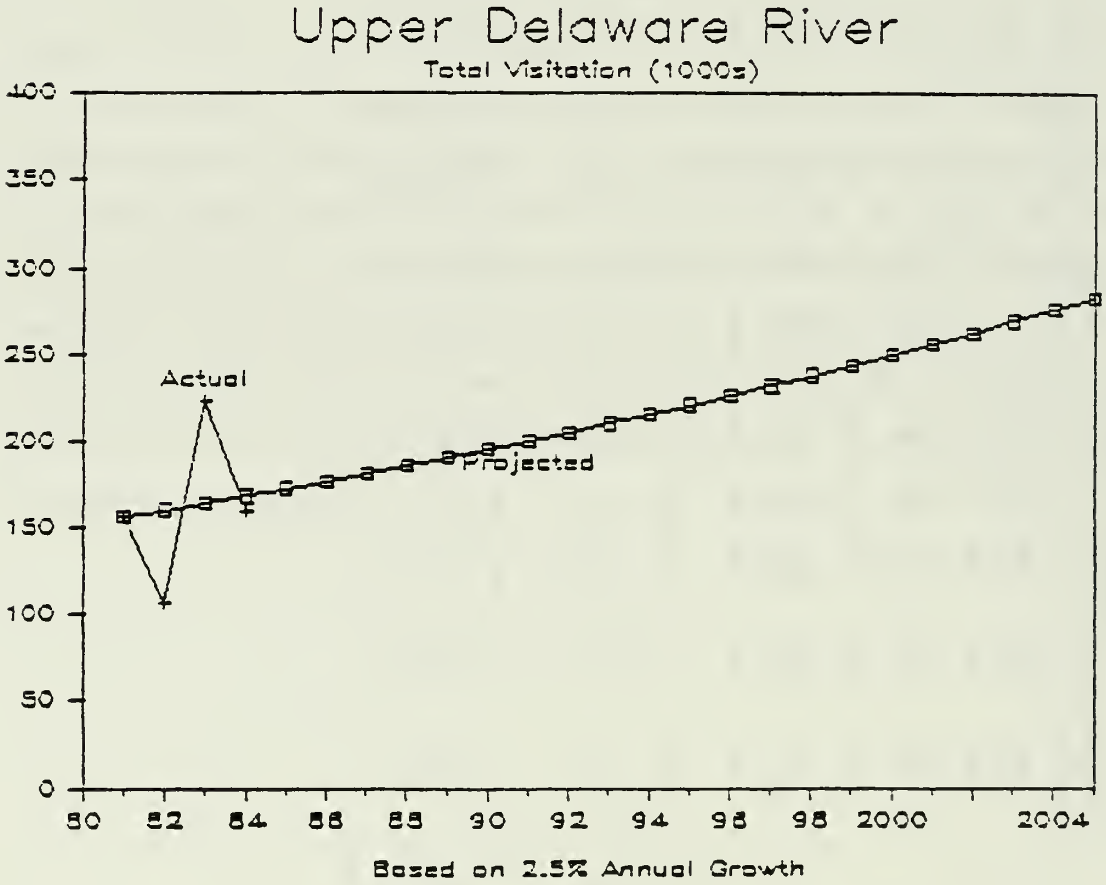

TABLE C.2 UPPER DELAWARE SCENIC AND RECREATIONAL RIVER
Total Visitation (1000s)

Year	Actual	Smoothed	Projected
81	156.4	156.4	156.4
82	106.5	116.5	160.3
83	223.1	201.8	164.3
84	159.9	168.3	168.4
85			172.6
86			177.0
87			181.4
88			185.9
89			190.6
90			195.3
91			200.2
92			205.2
93			210.3
94			215.6
95			221.0
96			226.5
97			232.2
98			238.0
99			243.9
2000			250.0
2001			256.3
2002			262.7
2003			269.3
2004			276.0
2005			282.9

Projections are based on a 2.5% annual growth rate. Smoothed values are based on an alpha of .8.

Total Growth Rate

2.5/yr.	=	13.1%/5 years
		28.0%/10 years
		63.9%/20 years

Total numbers of structures for hamlet, scattered, old, new, from forest, and from agriculture were calculated for each town and for the entire corridor.

Soil Suitability for Septic Effluent

Since the Upper Delaware River corridor incorporates several counties in both Pennsylvania and New York, several sources for soil information were utilized. These included:

1. Twelve Soil Conservation Service overlays reduced to match the USGS quad sheets.
2. Soil Survey for *Wayne County*.
3. Soil Survey for *Orange County*.
4. General soil descriptions for *Delaware County*.
5. Soil interpretation sheets and Soil Survey for *Sullivan County*.
6. Soil Survey for *Pike County*.

With the above information, soils not suitable for development were mapped for Pike and Orange counties. However, extensive soil codes for Sullivan and Wayne counties necessitated interpretation by several soil experts in New York and Pennsylvania to adequately locate the unsuitable soils. Because soils for Delaware County were listed by associations, rather than by series (as was the case with all other counties), generalizations were made for the purpose of mapping consistency.

Slopes of 15 Percent or Greater

USGS quad sheets formed the base for mapping steep slopes (15% or greater). After the areas that contained 15% or greater slopes were shaded, the acreage of these areas were counted using a grid. Totals were calculated for each of the following:

1. Total acres of slopes 15% or greater for each town.
2. The percent of each town's acreage within the river corridor boundary which has steep slopes.
3. Total acres in the corridor which are 15% slope or greater
4. Percent of the corridor with steep slopes.

100 Year Flood Plain

The Pennsylvania Department of Environmental Resources provided eleven large mylar maps, which were photographically reduced to the Upper Delaware River Corridor base map size. The flood plain information was then transferred to the topographical base map. Because some mylars were incompleted or missing, this needed data was obtained from National Flood Insurance Program maps and interpolation of NPS background material. These subsequent maps were also reduced to match the base map scale.

Fishery Habitats and Spawning Areas

Data gathered for the Fishery Habitats and Spawning Areas map was obtained from several sources in New York and Pennsylvania. The New York Department of Environmental Conservation (DEC) identified streams and tributaries of important spawning and nursery habitats for trout, American shad and small mouth bass. The DEC also provided boundary maps specifying several important trout spawning tributaries. Two DEC, Division of Fish and Wildlife brochures outlined streams of importance, trout "blue ribbon streams" and "special fishing streams."

The Pennsylvania Fish Commission identified tributaries of major importance for trout, American shad and small mouth bass. Also supplying information for Pennsylvania was the Delaware River Basin Commission, which has done extensive studies of American shad in the Delaware River. Maps illustrating spawning and nursery areas were provided, as well as a report detailing the management of shad in the Delaware. (See also Appendix B, Fish and Wildlife Service Endangered Species Consultation.)

Historic and Archeological Resources

Specific site information for the Historic and Archeological Resources map was generated by consulting three different sources: the State University of New York at Binghamton's Cultural Resource Survey, New York's State Historic Preservation Office (SHPO), and the NPS staff at the Upper Delaware River. The Cultural Resources map from the 1983 EIS and the archeological maps sent by the NY SHPO were also reviewed.

Existing Recreational Facilities

After data verification, the "Existing Recreation Lands" map from the 1983 EIS was updated and correlated with the "Public and Quasi-Public Recreation Facilities" chart contained within this draft EIS Report. National Park Service staff at the Upper Delaware and the Wayne County Planning Department were consulted.

Proposed Recreational Facilities

Information concerning proposed recreational facilities was derived from the River Management Plan and verified through conversations with the NPS staff at the Upper Delaware.

2. Working Maps

Zoning

Zoning maps were obtained from towns which have them (some towns only have subdivision ordinances). The maps that were available were reduced or enlarged to the USGS base map scale. The zoning and district information was then transferred to the Delaware River Corridor base map.

Wetlands

Basic wetlands areas were delineated from the USGS topographical maps. Wetlands for Sullivan and Orange Counties from the New York State Department of Environmental Conservation, Division of Regulatory Affairs were used for reference. No final maps for Delaware County, NY were available from the Fish and Wildlife Department.

For Pennsylvania, the Division of Coastal Zone Management of the Department of Environmental Resources made four final maps used for preparation of the working wetlands map. The four maps applicable to the Delaware corridor were Eldred, Shohola, Port Jervis North and Pond Eddy.

Structures with 100' of the River, Steep Slopes and Ridgelines

Based on the land cover, maps were generated which indicated structures built since 1965-1968 within 100' of the Delaware River, on steep slopes or ridgelines. A list was subsequently compiled listing and totaling each category by township. Totals were also calculated for the entire corridor.

Important Species

Information for New York State originated from draft maps and lists of rare plant sites produced by the New York Natural Heritage Program. A review of critical habitat maps at the New York Department of Environmental Conservation, Wildlife Division was also conducted.

For Pennsylvania, plant information was derived from the NPS/Morris Arboretum Report "Endangered, Threatened, Vulnerable and Rare Vascular Plants of the Pennsylvania Portion of UPDE River," and the NPS Regional Scientist. For animal information, an interview with NPS staff at the Upper Delaware Narrowsburg office was held and the Pennsylvania Biological Survey was consulted.

APPENDIX E - WATER QUALITY TESTING DATA - 1985
UPPER DELAWARE SUMMER LIMNOLOGICAL PROGRAM

Report of Findings Representing the Preliminary Analyses of Data for the Upper Delaware Summer Limnological Program

Summary of Work

From June 3 through August 30, 1985, the Delaware River Basin Commission (DRBC) obtained water quality data from 84 tributaries and Delaware River locations in the Upper Delaware Scenic and Recreational River (UDSRR), the Delaware Water Gap National Recreation Area (DWGNRA), and the intervening eight miles. The distribution of the sampling was as follows: UDSRR tributaries, 38 sampled; UDSRR river locations, 12 sampled; intervening reach, 3 locations sampled; DWGNRA tributaries, 22 sampled; and DWGNRA river locations, 8 sampled.

Over 350 station-visits* were made with data obtained on fecal bacteria, dissolved oxygen, pH, conductivity and temperature. Biological samples from 65 station-visits were also collected and processed from 46 individual river locations or tributaries. In addition, seven follow-up surveys were performed in response to the data findings: three in the UDSRR area, two in the intervening reach and two in the DWGNRA. Literally thousands of data were obtained.

As part of the program, UDSRR staff collected bacterial samples at three Delaware River locations in May (analyzed by DRBC) and analyzed night time dissolved oxygen concentrations once at two locations on 3 nights each. The DWGNRA staff obtained data on 15 tributaries (including 3 not sampled by DRBC) and 10 Delaware River locations (including 2 not sampled by DRBC) with a total of 191 station-visits. The DWGNRA sampling (May through September) were conducted by the Resource Management staff and the weekly beach monitoring program was performed by the Maintenance Department. Most DWGNRA samples were analyzed at the NPS Bushkill Laboratory. The DWGNRA and DRBC staffs conducted mutual quality assurance activities throughout the sampling season and provided each other with equipment and manpower backup when needed.

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* A station-visit is defined as one trip to one location with at least one water quality parameter sampled.

The following summarizes the 1985 Upper Delaware Summer Limnological Program.

Number of Locations Sampled

	UDSRR	Intervening Reach	DWGNRA	Total
Tributaries	38	1	25	64
River Locations	12	2	10	24
Total	50	3	35	88

Number of Station Visits

DRBC	NPS-UDSRR	NPS-DWGNRA	Total
350	9	191	550

Summary of Preliminary Findings

1. The data indicate that most study area tributaries and Delaware River locations have good to excellent water quality. Exceptions are noted.

2. The 1985 data collection program coincided with a period of less-than-normal precipitation (including the pre-sampling period) and reduced flow releases from the three New York City reservoirs. The impact of these circumstances was felt on the UDSRR. In the UDSRR water quality was visually degraded due to increased aquatic plant growth (algae, rooted plants and periphyton). The reasons for the increased plant activity are due to the lack of spring nutrient/sediment flushing, the slower stream velocities and the greater amount of river bed exposure to sunlight penetration. The plant activity is believed responsible for the apparent greater amounts of river foam and films observed during the summer. Chemically, dissolved oxygen concentrations in the river generally were at or greater than saturation. Extremely high super-saturation was observed on numerous occasions including values greater than 150%. The effect was most noticeable in the upper reaches of the UDSRR and were, as expected, accompanied by high pH values, which occasionally violated stream standards. Concern for the corollary drop in dissolved oxygen during night times led to night time D.O. measurements in late August. The

sampling indicated that D.O. was not decreasing to values below stream standards, but the possibility cannot be discounted at other locations and dates. In general, however, it is believed that the drought-related impacts were more visual than of serious water quality concern. In certain tributaries fecal bacterial levels appeared to increase greatly just before the stream dried up. This phenomena has been suggested previously as one possible course of rain-related bacterial increases; the result of runoff flushing out stagnant water pools.

3. The most polluted tributaries in the DWGNRA are Cherry and Brodhead Creeks. Cherry Creek is a public health threat as reflected by high fecal coliform values. The organic pollution (raw sewage discharges) does not appear to deleteriously impact aquatic life. Brodhead Creek is less of a public health threat, but pollution in the watershed (point and non-point sources) appears to impact aquatic life negatively. Projects to correct problems in these watersheds are currently in the pre-construction review process. The DRBC/NPS data are an excellent baseline for assessing water quality improvement as a result of these projects.

4. Special surveys were conducted on White Brook, the Poxono-Depew Island reach of the Delaware and the Port Jervis-Milford reach of the Delaware. White Brook has unusually high conductivity values. The survey concluded that limestone deposits were the likely cause of high conductivity and not a landfill as was originally theorized. The Poxono Island survey was the result of higher-than-expected fecal coliform values. It has been tentatively concluded that these values are the result of sample taking in the backwater areas created by low flows. Backwater areas as a source of naturally occuring bacteria is a potential special study in 1986. The Port Jervis survey was the result of past data suggesting that the Port Jervis-Matamoras area is the major contributor of fecal bacteria to the Delaware River in the DWGNRA. The 1985 survey data supports this tentative conclusion. Bacterial levels were highest on the New York side of the river and upstream of Port Jervis sewage treatment plant discharge. More investigation is warranted.

5. Data for most UDSRR tributaries indicate no water quality problems. Exceptions are Little Equinunk Creek which appears to be impacted by streams transversing barnyard areas and Callicoon Creek within the Town of Callicoon. Neither condition appears particularly serious although some type of follow-up actions should occur. The latter may be responsible for the higher than normal fecal bacterial levels observed at the Callicoon Access Area--New York.

6. Because of the unusual hydrological conditions, it was not possible to obtain significant information on rain-related non-point sources. However, it is believed, in most cases, that the data set represents critical water quality conditions. A full analyses of the data will be published in the annual report of the Upper Delaware Summer Limnological Program. This report will also recommend follow-up activities by the DRBC, the NPS and other agencies, including recommendations concerning future monitoring.

7. Data acquired in 1985 are presented in the attached listings. The data should be considered preliminary since corrections are possible until final publication. It is planned that DRBC and NPS data from 1984 and 1985 will be entered into the U.S. EPA Storet system in 1985.

APPENDIX F - LAND USE REGULATIONS AND JURISDICTION

The 15 towns and townships exercise all their traditional rights and powers. Under the powers granted respectively by the Pennsylvania Muncipalities Planning Code and the New York Town Law's zoning and subdivision enabling provisions, local governments are largely responsible for determining present and future land uses within their borders.

In New York, six of the eight towns have zoning ordinances, and one town is in the process of developing an ordinance. All eight have subdivision regulations. In Pennsylvania, four of the seven towns currently have zoning ordinances, while six of the seven have enacted subdivision regulations. The New York towns of Delaware, Tusten and Fremont, and the Pennsylvania townships of Damascus and Lackawaxen have designated river districts.

State law in both New York and Pennsylvania also authorizes towns to enter into intergovernmental cooperation agreements for the performance of certain functions. These agreements can also be entered into with towns in each other's state. The Pennsylvania Intergovernmental Cooperation Act is very broad, and authorizes local governments to jointly cooperate in the exercise of "their respective governmental function, powers or responsibilities." Pennsylvania's Municipalities Planning Code further provides specific authority for local governments to prepare joint municipal comprehensive plans and joint municipal zoning ordinances. New York's Interlocal Agreement Act authorizes local governments to enter into cooperative agreements for the performance of a broad range of functions including, among other things, garbage collection and disposal, sewage disposal, planning services and the provision of parks and other recreation areas.

Table F-1: Inventory of Local Land Use Controls and Plans

	Planning Agency	Comprehensive Plan	Zoning Ordinance	Zoning Appeals Agency	Site Plan Review*	Building Inspector	Subdivision Regulations	Flood Insurance	Sanitary Code	Building Permit ordinance	Mobile Home Ordinace	Building Code	Junkyard Ordinace
New York Delaware County													
Hancock	X	-	-	-	-	X	X	X	-	X	-	-	-
Orange County													
Deerpark	X	X	X	X	X	X	X	X	U	X	X	X	X
Sullivan County													
Cochecton	X	-	X	X	-	X	X	U	-	X	X	X	X
Delaware	X	C	X	X	X	X	X	X	X	X	X	X	X
Fremont	X	-	X	X	X	X	X	X	U	X	X	X	X
Highland	X	-	X	X	X	X	X	X	X	X	U	X	C
Lumberland	X	X	X	C	C	U	X	X	X	X	X	X	U
Tusten	X	X	X	X	X	X	X	X	X	X	X	X	-
Pennsylvania													
Pike County Lackawaxen	X	X	X	X		X	X	X	X	X	X	X	X
Shohola	X	X	X	X		X	X	X	X	X	X	X	X
Westfall	X	X	X	X		X	X	X	X	X	X	X	X
Wayne County Berlin	X	X	-	-		-	-	X	X	X	X	X	-
Buckingham	-	X	-	-		-	X	X	X	X	X	-	-
Damascus	X	X	X	X		-	X	X	X	X	X	-	X
Manchester	X	X	-	-		-	X	X	X	X	X	-	-

* Not applicable to Pennsylvania Townships

X: Exists
-: Not existing
C: Completed but not adopted
U: Unknown

Counties enforce county ordinances, maintain county roads and bridges, and prepare and update comprehensive plans. Counties are also responsible for reviewing certain local land use actions. The Pennsylvania Municipalities Planning Code provides for advisory review by county planning agencies of: applications for local subdivision and land development approval; proposed local zoning ordinances and amendments; and planned residential development applications (in towns which authorize such developments). In New York, Article 12-B of the General Municipal Law requires county planning board review of any local zoning regulation, zoning amendment, special permit, variance, or subdivision plat approval affecting, among other things, property located within 500 feet of: the town boundary; an existing or proposed county or state park or other recreation area; or an existing or proposed county or state road. If the county planning board disapproves the proposed local action, the involved town agency can act to the contrary only by a vote of a majority plus one of all its members.

Both states operate several programs that have a direct bearing on land use. Among the principal New York State laws and programs affecting land use are the following:

(1) The State Environmental Quality Review Act ("SEQRA") requires the preparation of environmental impact statements for actions undertaken by state or local agencies (including towns and other political subdivisions of the State) which may have a significant effect on the environment. The impact statement is to assess alternatives to the proposed action, as well as mitigation measures to minimize adverse environmental effects.

(2) The Freshwater Wetlands Act establishes a process for classifying wetlands and regulating land use activities affecting them. The Act generally requires any person conducting an activity

affecting a wetland area greater than 12.4 acres in size to first obtain a permit. Activities covered by the Act include any form of draining, dredging, excavation, dumping, or filling, as well as the placing of any structures in the wetland. Permits are also required for activities occuring within 100 feet of the wetland "if they impinge upon or otherwise substantially affect the wetland." The Act allows for the regulation of wetlands less than 12.4 acres in size if an individual or group petitions the Commissioner of the Department of Environmental Conservation to include the wetland under the Act. The Act also provides for local government administration of the permit system.

(3) The Stream Protection Act requires that any person or local government must obtain a state permit prior to modifying or disturbing the bed or banks of a protected stream. This includes the removal of sand, gravel or other material, as well as the placement of fill. The Act exempts certain activities from the permit requirement, including the crossing of the stream by livestock and the withdrawal of irrigation water. The Act also requires permits for the construction of permanent docks or piers, as well as for the construction of any impoundments or obstructions across the stream (whether temporary or permanent). A principal exemption is for farm ponds. The Delaware River and many of its tributaries are covered by the Act.

Before granting a permit, the Department of Environmental Conservation is to consider the effects on soils, forests, water, fish and wildlife likely to result from the proposed change or modification of the stream or from the proposed removal of sand, gravel or other material from the stream bed or banks.

(4) The State Floodplain Management Program provides for the regulation of development within floodplain areas. The program requires minimum elevations for new construction, and sets other standards for construction within floodplain areas. State regulations do not apply within towns which have adopted local flood hazard regulations which meet minimum federal requirements for participation in the national flood insurance program.

(5) New York's "Realty Subdivision" Law provides that any subdivision involving five or more parcels must receive approval (from either the Department of Environmental Conservation or a city or county health department) of its plans for obtaining and furnishing adequate sewage facilities and water supply before any portion of the subdivision can be sold or before any building can be erected.

(6) The Solid Waste Management Law requires a Department of Environmental Conservation permit for solid waste management facilities, including sanitary landfills, incinerators, and other types of processing or disposal facilities. Permits are required both for construction and operation of the facility. The State's review is generally designed to ensure that the facility is sited, constructed and operated in an environmentally sound manner, and that no solid waste enters into either surface or ground waters.

(7) The Mined Land Reclamation Law requires that all mining operations involving the extraction of more than 1,000 tons of minerals (including coal, sand, gravel or any "solid material or substance of commercial value found in natural deposits") within

a twelve month period obtain a permit from the Department of Environmental Conservation. In order to obtain a permit, the applicant must submit a "mined land-use plan," which must include information regarding the proposed mining method and program for preventing pollution and soil erosion loss, as well as a reclamation plan covering revegetation, disposal of debris and waste, and regrading. The law further requires the posting of a bond to cover the estimated cost of the necessary reclamation work.

(8) The Oil, Gas and Solution Mining Law requires a permit from the Department of Environmental Conservation prior to drilling for oil or gas. Operators must maintain an adequate bond to cover the costs of well plugging.

(9) The Cooperative Forest Management Program establishes regional forest practice boards throughout the State. Each regional board is authorized to set voluntary forest practice standards for its region, and to assist landowners with all phases of forest management.

(10) The State Real Property Tax Law provides for property tax relief to encourage the preservation of forest lands. In order to qualify for the program, the landowner must have an approved management plan. The plan must be prepared by a forester and must, among other things, describe such erosion and sediment control measures as may be necessary.

(11) The Agricultural District Act empowers county legislative bodies, on petition from owners of at least 500 acres, to establish agricultural districts. Land within an agricultural district is

eligible to be assessed at agricultural value rather than market value (agricultural lands outside of districts are also eligible for agricultural value assessment under certain conditions). The creation of an agricultural district also limits (within the district) the use of public funds that would facilitate non-farm land uses, as well as local regulations that would unreasonably restrict or regulate farm structures or farming practices.

(12) The Soil and Water Conservation District Law provides for the creation of county conservation districts. Each district is authorized to develop comprehensive plans for the conservation of soil and water resources, for the control of soil erosion, for the prevention of floodwater and sediment damages, and for agricultural water management. The law also calls for each district to develop individual soil and water conservation plans for every owner or occupier of more than 25 acres of land used to raise agricultural or forestry products who requests such a plan.

(13) The New York Public Service Law requires the Public Service Commission to approve the routing of all major utility transmission facilities. This includes electric transmission lines of 125 KV or more and at least one mile in length, or of between 100 and 125 KV and at least ten miles in length. Fuel gas transmission line extending more than 1,000 feet and used to transport gas at pressures of 125 psi or more are also subject to Commission approval. In deciding on applications the Commission is to determine whether the proposal represents the minimum adverse environmental impact taking into account the nature and economics of the various alternatives.

Among the principal Pennsylvania laws and programs affecting land use are the following:

(1) The Dam Safety and Encroachments Act provides for the regulation of dams and reservoirs, water obstructions and encroachments so as to protect the environment, people, property, and navigation. No person may construct, operate or modify any dam, water obstruction or encroachment without a permit from the Department of Environmental Resources. The term "encroachment" means any structure or activity which in any manner changes, expands or diminishes the course, current or cross section of any water course, floodway, or body of water. This includes aerial as well as water crossings, bridges and major piers. A "body of water" is defined as any natural or artificial lake, pond, reservoir, swamp, marsh or wetland. Thus, the Department has the authority to regulate dredging and filling activities (as encroachments) and to regulate all dams, obstructions and encroachments in wetlands (as bodies of water).

(2) Pennsylvania Sewage Facilities Act provides for the protection of public health, safety, and welfare through the development and implementation of sewage waste disposal plans and regulations. Municipalities must submit plans for sewage services to DER for areas within its jurisdiction. Two or more municipalities may submit joint plans. The plans include current and projected service for the next ten years, and discuss areas experiencing sewage disposal problems. The official plan requirement helps delineate where new development will take place, and can be used to minimize sprawl and development in scenic and recreational areas.

The Act also requires a permit for the construction and installation of individual and community sewage systems. Proposed systems must conform to the official municipal plan. County health departments, municipalities, or local agencies may administer the permit system. The Act further provides that contracts for the sale of lots in areas without a community sewage system must indicate the lack of a system and the need for an individual sewage system permit.

(3) The Soil Conservation Law provides for the creation of county conservation districts which are authorized, among other things, to cooperate with area landowners and municipalities on erosion control and prevention projects, and to help in implementation of the sedimentation aspects of the State Storm Water Management Act.

(4) The Clean Streams Law contains provisions designed to control erosion and the sedimentation of waters. These provisions include the requirement for a state permit whenever earthmoving activities disturb 25 acres or more. The Department of Environmental Reserves must review the adequacy of the applicant's plan to mitigate soil erosion. The Department may delegate the administration and enforcement of the permitting to local governments provided the local government has an acceptable plan for administering the program.

(5) Pennsylvania's Floodplain Management Act requires municipalities having areas subject to flooding to adopt floodplain management regulations (conforming to the National Flood Insurance Program). The Department of Community Affairs, in consultation with the

Department of Environmental Resources, reviews and approves all local floodplain management regulations. The Department of Community Affairs has also listed types of structures which may present a special hazard to public health or safety if located in floodplain areas. These include hospitals, nursing homes, jails, and new mobile home parks. Such structures cannot be built in the floodplain unless the municipality determines that the structure will be built in a manner which protects the health and safety of the public and the structure's occupants, and that the structure will be located and designed so as to prevent possible pollution, increased flood levels, and debris endangering life or property.

(6) The Solid Waste Management Act provides that any person or municipality owning land to be used for solid waste processing, storage, treatment or disposal, must obtain a permit from the Department of Environmental Resources. The short-term storage of non-hazardous by-products, which will be used to process or manufacture other products, does not require a permit, nor does the storage of non-hazardous agricultural waste or food processing waste. Engineering plans and relevant data prepared by a registered professional engineer must accompany the application. All applicants must explain how they intend to comply with other Pennsylvania environmental acts including the Clean Streams Law, the Surface Mining Conservation and Reclamation Act, the Air Pollution Control Act, and the Dam Safety and Encroachment Act in their permit application.

The Department may revoke a permit if any provision of the Act (or of any other State or Federal environmental protection law) is not complied with. A permit may also be revoked or suspended if the facility creates a public nuisance or potential hazard to the public or adversely affects the environment even if it is operating in compliance with the rules and regulations of the Solid Waste Management Act.

(7) The Pennsylvania Farmland and Forest Land Assessment Act is designed to encourage the retention of farm and forest land, and to minimize conversion of such land to other uses. This is accomplished by providing that property tax assessments for land participating in the program be based on use value instead of fair market value. In return for the lower assessment the landowner agrees to retain his land as farm or forest land for a specified number of years.

(8) The Noncoal Surface Mining Conservation and Reclamation Act regulates surface mining of all minerals (including sand and gravel) other than coal. A state permit is required for mining operations involving 500 tons of minerals or more per year for commercial purposes. In order to receive a permit, the applicant must submit a surveyed map or plan showing the affected land, along with a detailed reclamation plan. The reclamation plan must include a plan for establishing a diverse, effective and permanent vegetative cover at least equal in extent of cover to the area's natural vegetation. Before the permit is issued, the Department of Environmental Resources must approve the reclamation plan and must find that the proposed operation will not cause pollution to the waters of the Commonwealth. The Act further requires the applicant to post a bond sufficient to cover the cost of completing the approved reclamation plan. The Act also generally prohibits any surface mining within 300 feet of any building and within 100 feet of the bank of any stream.

(9) The Surface Mining Conservation and Reclamation Act, which by a 1984 legislative amendment applies only to the surface mining of bituminous and anthracite coal, prohibits mining of such coal on any land within the boundaries of a federally designated Wild and Scenic River. Operations existing prior to August 4, 1977 are excepted.

(10) The Oil and Gas Act of 1984 regulates wells drilled for producing, extracting or injecting any gas, petroleum or other liquid related to oil or gas production. No well may be drilled without a permit from the Department of Environmental Resources. The Act requires the Department to consider the impact of a proposed well on public resources, including national or state scenic rivers, historical and archaeological sites, and habitats of rare and endangered flora and fauna and other critical communities. Each well owner or operator is required to restore the land surface within the area disturbed in siting, drilling, completing and producing the well. The Act contains additional requirements designed to minimize erosion and sedimentation and the pollution of surface and groundwater.

(11) Pennsylvania's Electric Transmission Line Siting Regulations provide for review by the Public Utility Commission of the routing of any high voltage transmission line (125 RV or more and at least one mile in length, or between 100 and 125 KV and at least ten miles in length). Among the information which the Commission is to consider in reviewing an application is the impact of the link on scenic and historic areas, including impacts on land use, soil and sedimentation, plant and wildlife habitats, terrain, hydrology and landscape. The applicant is also required to identify any archaeologic, geologic, historic,

scenic, or wilderness areas within two miles of the proposed right-of-way. Commission regulations further call on the applicant to identify reasonable alternatives routes and compare the merits and demerits of each route.

(11) The Pennsylvania Historic Districts Law Authorizes towns to establish historic districts. No such ordinance, however, can take effect until after the Pennsylvania Historical and Museum Commission has certified the historical significance of the district defined in the ordinance. The law provides that the local governing body may certify to the appropriateness of the erection, reconstruction, alteration, restoration or demolition of any building within the historic district, taking into account the effect of the proposed change on the historic and architectural nature of the district. The law authorizes the governing body to appoint a Board of Historical Architectural Review to provide advice concerning the issuance of certificates of appropriateness.

The National Park Service's jurisdiction focuses on recreation activities in and on the water. The National Park Service also has proprietary jurisdiction over lands and structures which the agency owns or leases. These lands, and these lands only are subject to Title 36 of the Code of Federal Regulations. In the Upper Delaware River Valley, these areas are:

o the headquarters site at Damascus
o the leased North and South District offices in Cocheton and Shohola
o the Roebling Bridge in Lackawaxen and Highland
o the leased visitor contact facilities in Narrowsburg
o the leased access sites at Skinners Falls and Narrowsburg

The jurisdiction within the Delaware River drainage area of the Delaware River Basin Commission was established by the 1961 Interstate/Federal Compact, (P.L. 87-238). The Commission's responsibilities include water supply, conservation and quality, water storage projects, drought contingencies, flood loss reduction, water based recreation, fisheries, flow maintenance, and hydroelectric power generation. The Commission reviews specific proposed water-related development projects in various categories which meet minimum requirements established by the Commission's Administrative Manual, Part II, Rules of Practice and Procedure. In addition, the Commission may review any project referred by a signatory state or federal agency to the Commission.

Appendix G - Cooperating Agencies

The National Park Service (NPS) requested that the following agencies participate as a cooperating agency to review draft material for the Environmental Impact Statement for the Upper Delaware Scenic and Recreational River:

Mr. Gerald Hansler, Executive Director
Delaware River Basin Commission
P.O. Box 7360
West Trenton, NJ 08628

Richard Pepino
Environmental Protection Agency
NEPA Compliance Section
841 Chestnut Street
Philadelphia, PA 19107

Barbara Pastalove
Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

District Engineer
U.S. Army Corps of Engineers
2nd and Chestnut Streets
Philadelphia, PA 19106

Lou Wunderlich
U.S. Coast Guard
Third District Commander
Governor's Island, NY 10004

Charles Kulp
U.S. Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, PA 16801

William Harkness
Deputy Delaware River Master
U.S. Geological Survey
405 Broad Street
Milford, PA 18337

Their responses follow.

EIS - File

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

RECEIVED
OCT 9 1985

September 30, 1985

J. Glenn Eugster, Chief
Division of Park and Resource Planning
National Park Service
Mid-Atlantic Region
U.S. Department of Interior
143 South Third Street
Philadelphia, Pennsylvania 19106

Re: Proposed Upper Delaware River Management Plan (RMP)
D18 (MAR-PD) - Upper Delaware Draft EIS

Dear Mr. Eugster:

In response to your letter of September 23, 1985 regarding the RMP/EIS project, we wish to confirm our desire to participate as a cooperating agency.

Thank you for the opportunity to be involved with the review and comments on this project. Further correspondence should be directed to James L. LaBuy (215/597-0355) of my staff.

Sincerely,

Richard V. Pepino

Richard V. Pepino, Chief
NEPA Compliance Section

cc: William Wisniewski (3PM00)
Charles Sapp (3WM50)
Chris Miltscher, Region II

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

RECEIVED
OCT 23 1985

OCT 18 1985

Mr. Joseph DiBello
Division of Park and Resource Planning
National Park Service, Mid-Atlantic Region
U.S. Department of Interior
143 South Third Street
Philadelphia, Pennsylvania 19106

Dear Mr. DiBello:

This is in response to the request for comments regarding the notice of intent to file a draft environmental impact statement (EIS) for the Upper Delaware River Management Plan. We have reviewed the notice of intent and scoping issues to be addressed in the draft EIS, and find that they adequately cover the general environmental impacts that should be addreseed for a project of this type.

We look forward to reviewing the draft EIS, and request that five copies be sent to us when it becomes available. If there are any questions, Mr. Robert Hargrove of my staff may be contacted at (212) 264-5390.

Sincerely yours,

Barbara Pastalove

Barbara Pastalove, Chief
Environmental Impacts Branch

cc: R. Pepino, EPA Region III

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106-2991

OCT 16 1985

REPLY TO
ATTENTION OF
Environmental Resources Branch

Mr. J. Glenn Eugster
Chief, Division of Park
and Resource Planning
U.S. Department of the Interior
National Park Service
Mid-Atlantic Region
143 South 3rd Street
Philadelphia, Pennsylvania 19106

Dear Mr. Eugster:

This is in response to your letter of September 23, 1985 concerning the proposed Upper Delaware River Management Plan.

In accordance with your request and Section 1501.6 of the Council of Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, the U.S. Army Corps of Engineers (Corps) will participate as a cooperating agency for the proposed project. As requested, the Corps' participation will consist of review of preliminary draft material within our area of expertise.

If there are any questions regarding this letter, please contact Mr. Roy E. Denmark, Jr., Chief, Environmental Resources Branch at (215) 597-4833 or at the above address.

Sincerely,

~~Nicholas~~ J. Barbieri, P.E.
~~Chief~~, Planning/Engineering Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

October 9, 1985

J. Glenn Eugster, Chief
Division of Park and Resource
Planning
National Park Service
143 South Third Street
Philadelphia, PA 19106

Re: D18(MAR-PD)
Upper Delaware draft EIS

Dear Mr. Eugster:

Due to time and personnel constraints, we will not participate as a cooperating agency in preparation of the subject draft EIS. We would be willing to review and provide informal comments on draft documents prior to submitting formal comments on the draft EIS if you so desire.

Sincerely,

Edward Perry

Edward W. Perry
Acting Field Supervisor

United States Department of the Interior
GEOLOGICAL SURVEY
OFFICE OF THE DELAWARE RIVER MASTER
405 Broad Street
Milford, Pennsylvania 18337

OCT 1 1985

September 27, 1985

Mr. J. Glenn Eugster
Chief, Division of Park and Resource Planning
National Park Service
Mid-Atlantic Region
143 South Third Street
Philadelphia, PA 19106

Dear Mr. Eugster:

This will confirm receipt of your letter dated September 23, 1985 concerning the draft EIS you are preparing for the Upper Delaware River Management Plan (RMP).

I discussed your request for my participation as a cooperating agency in review of draft materials with Joseph DiBello by telephone today. This letter will confirm my agreement to assist in any way that you feel I can be of help.

Sincerely,

William E. Harkness
Deputy Delaware River Master

cc: F.T. Schaefer
Delaware River Master